**Notes on diseases of the testis / by Samuel Osborn.**

# NOTES ON

# DISEASES OF THE TESTIS

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# NOTES

ON

# DISEASES OF THE TESTIS

BY

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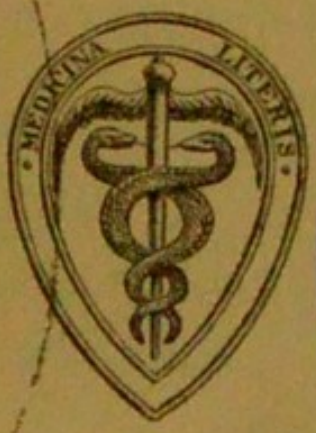
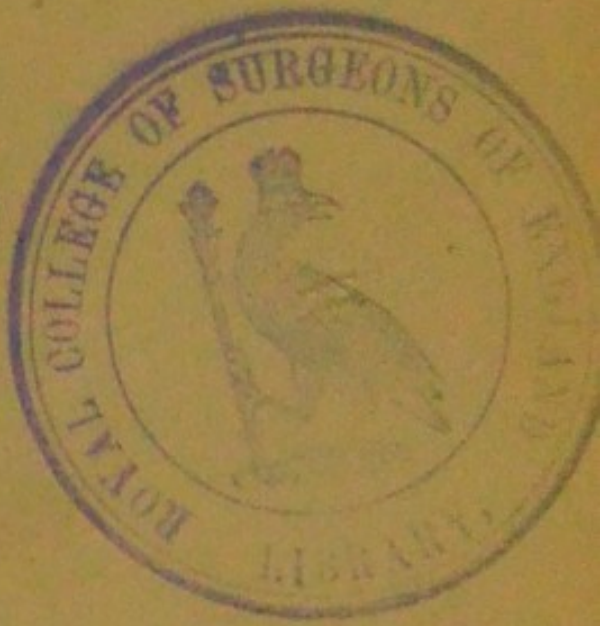
LATE SURGICAL REGISTRAR TO ST. THOMAS'S HOSPITAL



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1880

# PREFACE.

I HAVE for many years taken considerable interest in diseases of the testicle, and sought, as far as lay in my power, to strengthen my own experience with that of others. Differences of opinion with the standard authorities on this subject will, I have no doubt, be discovered. These differences, however, I can assure my readers, have received the fullest consideration.

Whilst apologizing for any errors which may be present, I must not omit to thank Mr. Clutton for his many kind suggestions—errors which would have been otherwise more numerous.

10, MADDOX STREET,
REGENT STREET, W.

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# NOTES

ON

# DISEASES OF THE TESTIS.

## CHAPTER I.

### INJURIES OF THE TESTIS.

Considering their position, pendulous character, and extreme sensibility, it is surprising that the testicles are not more often the subject of injury, the sac of the tunica vaginalis and the unyielding structure of the tunica albuginea being probably their chief protectants.

Contused wounds of the testis, generally brought about by blows either in riding, cricket, or other sports, are attended with inflammation either of the protecting sac of the tunica vaginalis or of the testicle itself.

A blow upon the scrotum will I believe produce parietal hydrocele, whilst a blow in excess of the expenditure of force required to cause hydrocele will produce orchitis. The injury may in addition rupture some blood-vessel, giving rise to hæmatocele of the tunica vaginalis or

extravasation of blood into the cellular tissue of the scrotum. Whatever be the ultimate result, the first receipt of the injury is accompanied by most severe pain extending to the loins, the patient being doubled up with the intensity of the suffering. There is a feeling of sickness accompanied by cold sweats, and all the symptoms of shock in a mild degree.

Rest, which the patient will almost necessarily adopt from the pain occasioned by any movement, should be strictly enforced, and ice or evaporating lotions applied. The importance of rest cannot be too strongly insisted upon, as contused wounds are very frequently the exciting cause of more serious diseases.

Incised wounds of the testis generally heal with great facility. In some cases the testicle, although exposed and entirely denuded of its scrotal coverings, which have been stripped off by incised or lacerated wounds, will subsequently regain a covering and frequently movement also in its secondary enclosure.

Punctured wounds are also of little moment, although such are frequently the precursors of hæmatocele, as for instance in tapping of hydrocele. Such little thought is taken of puncturing the testicle, that it is recommended by some surgeons as a mode of treatment in acute orchitis.

Cases of self-castration are occasionally met with, and of which almost every hospital museum has proof. The act itself is self-evident of some mental deficiency, as also are those previous acts which predisposed to this self-mutilation. The arrest of hæmorrhage by the torsion or ligature of any bleeding points, and the subsequent application of ice or cold-water dressing being all the treatment required in these cases.

*Hæmatocele.* — Hæmatocele has been placed under the heading of injuries of the testis, because it owes its origin to some injury to the blood-vessels, either arteries or veins.

Hæmatocele is an effusion of blood into the sac of the tunica vaginalis or other unobliterated portion of the vaginal process of peritoneum, as well as into any cyst connected with the testicle, whether such cyst be of old standing or formed of coagulated blood clot. Thus it is possible to have vaginal hæmatocele, funicular hæmatocele, and encysted hæmatocele.

Vaginal hæmatocele is the form most frequently met with, and of which there are two varieties. True vaginal hæmatocele consists in the presence of blood only within the sac of the tunica vaginalis, whereas the other variety is on the border-ground between hydrocele and hæmato-

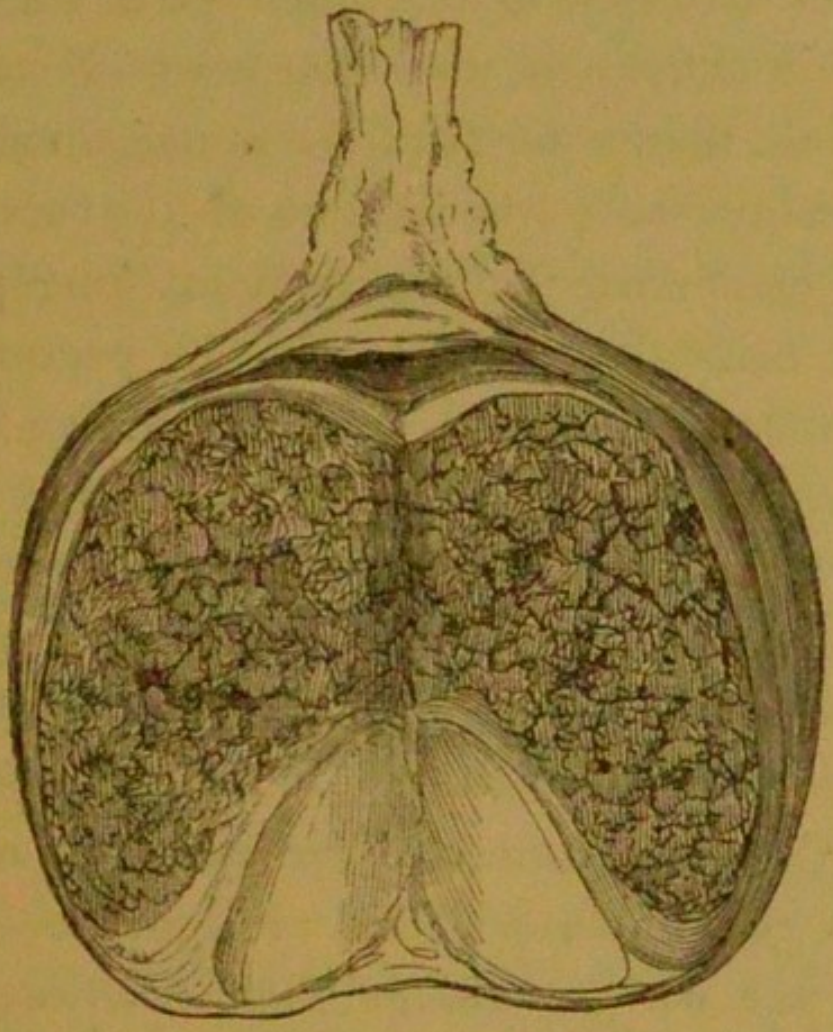
cele, being truly a hydrocele in which a greater or less amount of blood is present.

The latter is by far the more common, the amount of blood varying from a red discolouration of the serum to the presence of a greater or less number of coagula. The presence of blood in hydrocele is accounted for in one of the following ways—in the operation of tapping, either to injury received to some blood-vessel situated on the parietal layer of the cyst wall, or to puncturing the testicle from thrusting the trochar too far onwards. Also the rupture of a blood-vessel in a state of varicosity or not may be occasioned by the over-distension and consequent thinning of the cyst wall by the contained serum, or even after withdrawal of the serum, through no fault of the tapping, the wall of some vessel may give way for want of that support which the serum had previously given to it.

Pure hæmatocele is the consequence of some injury to a blood-vessel on the serous surface of the tunica vaginalis, such blood-vessel being either in a healthy condition or more probably diseased, and in a varicose condition. When a rupture of one of the spermatic vessels takes place on the serous surface of the tunica vaginalis, the opening is usually small, and therefore the outpouring of blood is gradual in contra-

distinction to the rapid and large extravasation which occurs when rupture takes place into the loose cellular tissue of the scrotum. A case of extravasation of blood into the cellular tissue of

FIG. 1.



Hæmatocele of the Tunica Vaginalis.
Prep. E. E. 84, St. Thomas's Hospital Museum.

the scrotum, or of encysted hæmatocele, is recorded by Mr. Bowman, where the swelling hung down to the knee-joint, and terminated fatally from the decomposition of the contents of the tumour.

Funicular hæmatocele, or extravasation of blood into some portion of the funicular process, is never of large size, the extent of space into which the blood is extravasated not allowing of much expansion, and its symptoms are identical with those of the vaginal variety. In most cases of hæmatocele the result of direct injury, a certain amount of extravasation of blood takes place into the scrotal tissues, and which may more or less obscure the true hæmatocele. Hæmatocele when once formed never remains long passive. If the blood be not absorbed, its presence excites inflammation in the cyst, the walls of which become thickened and indurated by plastic effusion. Suppuration in some cases occurs in the blood clot, and an opening is sooner or later formed in the scrotum to allow of the escape of the purulent matter. In other cases the blood becomes converted by age into a more or less reddish brown fluid or lines the interior of the sac with coagula similar to those lining aneurismal sacs.

After the receipt of some injury the testicle is noticed to gradually increase in size, this enlargement hourly progressing until, the cavity being filled, the opening in the vessel is compressed by the contained blood or the orifice in the vessel occluded by the formation of a coagu-

lum upon its ragged surface. Accompanying this enlargement there is always some ecchymosis of the scrotum, more especially when the injury is by direct violence.

Hæmatocele is in form either oval or pear-shaped, but like hydrocele its configuration and size depend upon the anatomical conditions of the part in which it is situated and the pathological changes which may have resulted prior to the affection.

Testicular sensation is always to be detected, the testis being found as in hydrocele normally situated at the lower and posterior part of the swelling. But it is well to remember that the testis is occasionally malplaced, and may be situated anteriorly. This inversion not being very readily detected, injury to the testicle has not unfrequently occurred, and finally necessitated excision of the organ.

Associated with hæmatocele there is always slight pain, and an absence of translucency. In the early stages fluctuation is perceptible, but subsequently there is a feeling of weight and solidity.

Hæmatocele is diagnosed from hydrocele by the sudden appearance of the swelling and its greater solidity. Presence of translucency is conclusive in favour of hydrocele, but its absence

does not militate against its being also a hydrocele, with thickened walls.

A long-standing hæmatocele, in which the tunica vaginalis is much thickened, may be mistaken for chronic orchitis, but the presence of testicular sensation always experienced at some part of the swelling is evidence sufficient of its being the former.

Between inguinal hernia and hæmatocele the diagnosis is occasionally very difficult, more especially in cases of funicular hæmatocele. In both the swelling occurs suddenly after some violent exertion, and may disappear gradually under the application of ice. The occasional presence of ecchymosis in the scrotum, the indistinct feeling of fluctuation, and the testicle being involved in the swelling, are in favour of its being a hæmatocele, and not hernia. Should any doubt exist, tapping should be avoided and the swelling cautiously cut down upon, for incision as now performed under the carbolic spray is so safe an operation that it may be performed without any fear.

When a hæmatocele is seen soon after the receipt of the injury, cold evaporating lotions or the use of an ice-bag, applied to the scrotum, is usually sufficient to cause the absorption of the blood. Irrigation, or the application of Dr.

Otis's coil, which consists of a piece of india-rubber tubing through which iced water is allowed to percolate, may be used, but neither is so effectual as the ordinary ice-bag. The scrotum should be kept suspended by putting a broad piece of plaster across the thighs, so as to form a ledge upon which the scrotum may rest. Tapping is a mode of treatment applicable to those hæmatoceles which merge into hydrocele, or to hæmatoceles in which the blood is fluid and remains for some time unabsorbed.

Incision down to the sac of the tunica vaginalis, under the carbolic spray, is a form of treatment which is highly beneficial, care being taken prior to the operation to determine the position of the testicle so that it may not be wounded. After the cavity containing the blood clot has been opened, its interior should be cleared out as thoroughly as possible, a piece of oiled lint placed in the wound, and the incision allowed to heal up gradually from the bottom. The success attending this mode of treatment is very great, as the blood cavity closes rapidly under the influence of the contractility of the scrotum.

Even when the sac of the tunica vaginalis and adjacent parts are much thickened and indurated treatment by incision usually succeeds; but in old persons, where a prolonged course of treat-

ment would not be desirable, excision of the testicle should be performed. Excision of the testicle is, however, seldom necessary, although it has been inadvertently done through error in diagnosis; this should be prevented by always isolating the testicle previous to ligaturing the cord, and thereby save the surgeon the mortification of excising a healthy testicle solely for hæmatocele.

## CHAPTER II.

### MALPOSITIONS OF THE TESTIS.

UNDESCENDED TESTICLE.—The testicles, instead of descending into the scrotum, are occasionally retained in some part of their course, and may occupy one of the three following positions. In the abdomen above the entrance to the inguinal canal; in the inguinal canal itself; or in the groin just outside the external inguinal canal. Of these three situations the second is the most frequent and the most serious as regards the integrity of the gland. According to the statistics of Wrisberg, the left is more frequently out of place, but in the seven cases which have come under my notice, they have all with one exception been on the right side.

In Fig. 2, taken from a boy aged twelve, both testes are situated in the inguinal canal, that, however, on the left side occupying a lower position than that on the right, the process of descent being nearer completion on the left side

on account of its priority in development. The peculiarly contracted condition of the scrotum, as

FIG. 2.

Undescended testicle on both sides.
The dotted lines indicate the position of the testes.

seen in the above diagram, when the testicle is not contained therein, is very noticeable, and is chiefly due to the absence of the testicle; but its absence may secondarily lead to the atrophy of the muscular walls of the scrotum, consequent

upon dereliction of function. The muscular fibres of the dartos have a definite purpose in supporting the testes, and have the same nerve supply which regulates the erectile functions of the penis. The testes may remain in the same position as at birth, or the position may become altered prior to puberty, but usually no alteration takes place after three weeks from birth. Mr. Curling states "that if not completed within twelve months after birth, it is rarely or never afterwards fully and perfectly completed without being accompanied with rupture, for the causes which cooperate at this late period tend as much to promote the formation of hernia as the descent of the testis." The causes of imperfect descent of the testis must be looked for amongst the several component parts by which the proper descent is effected—viz., the testicle, the channel through which it has to pass, and the means by which the former is made to traverse the latter. The testicle may be unable, as the result of peritonitis in utero, to reach the canal on account of adhesions having taken place between it and the peritoneum which covers it, or the peritoneum covering the testicle may have formed adhesions with the adjacent intestine or omentum; also as the result of peritonitis the passage along the posterior wall of the abdomen may be so ob-

structed that the descent of the testicle is prevented. If inflammation can communicate itself to the testicle, the converse holds good, that inflammation of the testicle can communicate itself to the peritoneum and an inflamed undescended testicle may set up peritonitis. For whether the gland be situated in the groin or in the abdomen the same causes which influence the gland in the scrotum influence it equally in its undescended position; and when in the abdomen, where the general peritoneal sac is its immediate covering instead of the closed sac of the tunica vaginalis, the danger to life is correspondingly augmented.

Increase in the size of the gland which takes place at puberty may be cited as one of the causes after birth in tending to prevent the completion of the descent, but prior to birth the size of the testicle has probably little to do with the failure of the process. The inguinal canal, after the passage of the testicle, commences to close at two points, at the upper inguinal opening and just above the testis, the obliteration proceeding along the funicular portion of the vaginal process until, the two meeting, the whole canal is obliterated. Should the testicle be tardy in its descent it meets with obstruction at one or other of these two points—viz., either at the internal or external abdominal ring; in the former, the

esticle is retained in the abdomen, at the entry to he inguinal canal; in the latter, the testicle is in he inguinal canal, just above the external abdomi- al ring. It is probable, looking at the great fre- uency with which the retained testicle is found n one or other of these two situations, that the constrictions at the internal and external abdo- minal rings are the most frequent causes of retained testis.

The descent of the testicle from the abdomen s mainly due to the contraction of the muscle called the gubernaculum testis, which, inserted above into the lower margin of the testicle, is attached below to the bottom of the scrotum, Poupart's ligament, and os pubis. This muscle like others is subject to considerable variation, and hence any imperfection in or non-development of any of its three attachments will cause a failure in the testicular descent; so also will paralysis of the same muscle, which we may conclude will affect this as it does other muscles of the body.

The functional condition of the gland in these three situations is of great importance, and it may be affirmed that when the testicle is situated outside the external abdominal ring it is perfect, but when in the abdomen and in the inguinal canal it is imperfect. A few cases have, however, been cited, where the testes retained in the abdo-

men were perfect, but they are not sufficient to invalidate the rule laid down above. The most serious position the testicle can assume is when situated in the inguinal canal, being then subject from its exposed situation to repeated inflammation from injury, or to compression applied to it in violent exercise by the muscles of the abdomen. Although the testicle is at first freely movable in the canal, it subsequently becomes fixed by repeated inflammation, and thus more liable to injury. Finally it may become atrophied from pressure or from successive inflammations chronically enlarged. It may also be the exciting cause of cancer, as represented in Fig. 6. It is rare to meet with persons having only one testicle or monorchides. They are generally considered by the laity to be sterile, but such is not the case, and surgeons should bear this in mind, as patients thinking themselves incompetent frequently develop suicidal tendencies, a duplicity of the organ being provisional against a failure in the power of either. Probably many patients in whom one testicle was retained in the abdomen were formerly placed under the heading of monorchides, but this term is confined to those cases where the testis is congenitally absent both from abdomen and scrotum; and the term cryptorchids to those where both testes are absent.

In both varieties the external organs of generation are found more or less ill developed.

The other diseases in this neighbourhood which it behoves the surgeon to be careful to diagnose are: the presence of an inguinal hernia on the same side as an undescended testicle situated in the abdomen, or the combination of an inguinal hernia with an undescended testicle in the groin and between a strangulated inguinal hernia and an inflamed undescended testicle in the inguinal canal. Cases of undescended testicle are frequently diagnosed as herniæ, simply because the scrotum is not examined as it should be in all cases as to whether the testicle is in its proper position or not. In any case of swelling in the groin, the question arises as to whether it is a hernia or an undescended testicle, the probability of its being the latter being increased by the absence of the organ from its proper situation; and on manipulation imparting the usual testicular sensation and having a more solid feel than the compressibility of a hernia. In form the testicle is oval, whereas hernia is more pear-shaped, and although both may be reducible into the abdomen, the testicle has never the impulse on coughing that a hernia has.

The symptoms of an inflamed undescended testicle are identical with those of acute orchitis;

but however severe the symptoms may be, and however closely they may resemble those of strangulated hernia, the vomiting never becomes stercoraceous, and when taken in connection with the previous history no error in diagnosis should be made. Should the symptoms continue, the possibility of a strangulated hernia being above the undescended testis must be taken into consideration, and operative interference resorted to. When speaking of the causes of imperfect descent, peritonitis in utero was mentioned as occasioning adhesions between the testicle and the intestine. Thus the testicle in its descent may drag with it the intestine to which it is attached, the two being combined in the groin, and the one following the other in all its movements. When the testicle lies in the inguinal canal its presence there prevents the vaginal process from closing at the upper part, and consequently a reducible inguinal hernia may be present above the testicle, or even pass below it.

If the testicle shows any inclination to descend into the scrotum, every means should be directed to that end. The application of a truss when the testicle is in the abdomen is advisable, for when thus situated the gland is in a better position than when in the groin, and taking into consideration the fact that twelve months after birth the process

is rarely completed without being accompanied by rupture, this treatment is the best.

When the testicle is in the centre of the inguinal canal, usually no truss can be tolerated, but if it is situated at the lower part of the canal, a modification of Wood's truss may be used; namely, an ordinary truss with a horse-shoe pad, the concavity of which lies above the testicle. If both testes are malplaced, the double truss should be made to slide, so that all pressure may be from above downwards, and not directly upon the testes.

Iodide of potassium has upon some subjects anaphrodisiac effects, and likewise produces shrinking of the testes. If the undescended testicle is chronically enlarged, this drug might be given with advantage, but otherwise, the testicle being a passive agent, no good would be obtained. In a case reported in the *Lancet*, the notes of which are subjoined, the above is exemplified. C. B., æt. 15. No notice was taken of the right testicle not being in its place until seven years ago; when, after a fall upon a fender, a painful swelling was found in the right groin. After a few days' rest the pain disappeared, and the swelling subsided. Six weeks ago when at school he fell when wrestling with another boy, his elbow striking him in the right groin. The testicle

again became swollen, subsiding slightly after two days, but not perfectly; and when seen on August 27th the testicle was then a little larger than a bantam's egg and very painful. An ice-bag was applied for three days, after which the testicle assumed its normal size. The testicle is situated in the inguinal canal, in which it can be moved backwards and forwards, but at the lower opening into the scrotum it is apparently stopped by the constricted ring and prevented from descending therein. The corresponding side of the scrotum is contracted from the absence of the testicle. For the last seven years he has, after walking for the space of two hours, been subject to the testicle becoming swollen. On September 5th he was ordered three grains of iodide of potassium three times a day, which after being taken for a month produced a diminution in size of both testicles, and manipulation was then tried to get the right testis into its proper place; but the constriction before spoken of impeded any such purpose and the testicle still remains in the inguinal canal.

If all other means fail to rectify the position of the testicle when situated in the groin, is operation justifiable—in other words, the division of the external abdominal ring? Mr. Hunter states that it is at the external abdominal ring

that the testis meets with the greatest difficulty in its descent, the smallness of the ring retaining the testicle in the inguinal canal. This is undoubtedly an argument in favour of operation, and as retention is never due to a shortening of the vas deferens, no impediment would be offered on that account.

Failing the power of placing the testicle in the scrotum by the division of the external abdominal ring, I think it would be justifiable to excise the testicle, knowing that when in the canal it is functionally useless, frequently liable to disease, and incommodious to the patient.

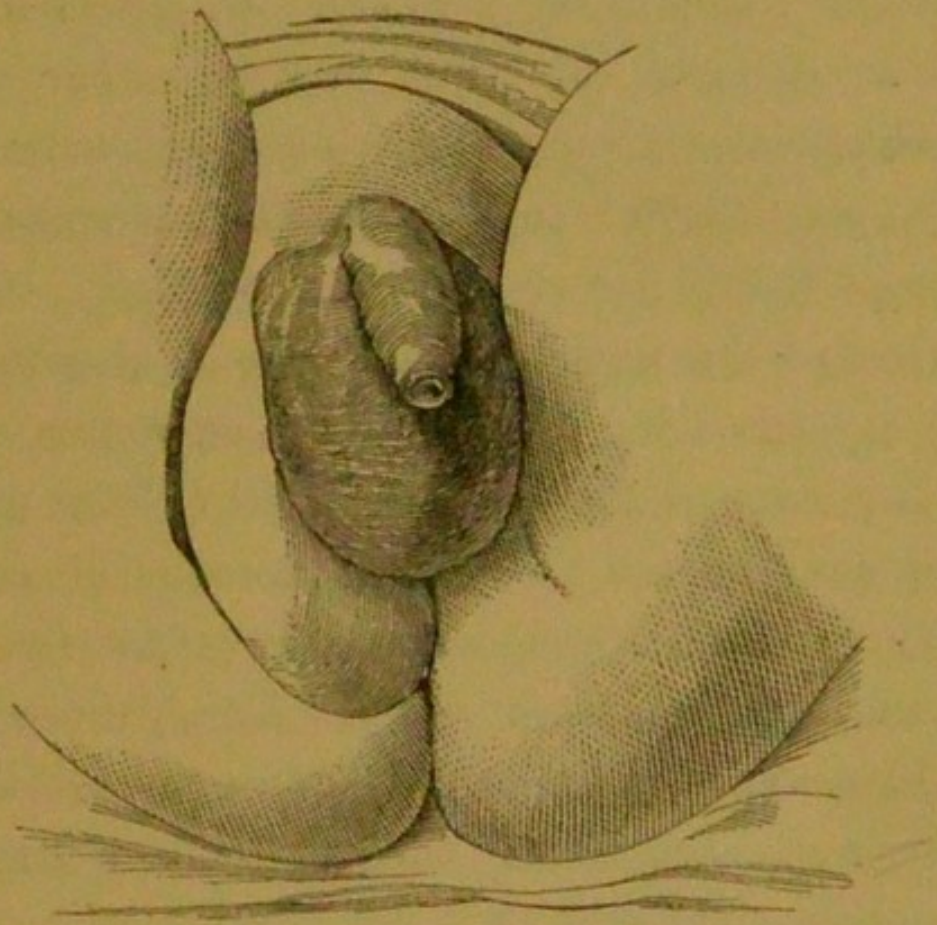
*Misplaced Testis.*—At times the testicle, instead of descending into the scrotum, descends into the perinæum. There are of this malformation two varieties; in one by far the more frequent the misplaced testis present in the perinæum is covered by ordinary integumental structure, whereas in the other it is covered by its usual corrugated integument. This, in my opinion, depends upon whether the testicle is situated beneath one or both layers of the superficial perineal fascia. In the subjoined case, which was kindly sent to me by Mr. Wagstaffe, the testicle was situated between the two layers of the superficial fascia, the attachment of the deep layer to the ramus of the pubes preventing the testicle assuming its proper position,

the septum of the scrotum being formed from the deep layer of the superficial fascia of which also the dartos is a continuation.

The presence of the testicle in the perinæum may possibly be occasioned by absence of the gubernaculum testis, or to some irregularity in the origin or insertion, more especially of its middle process, whereby the testicle is diverted from its natural course. With regard to its position a more unfitting one could scarcely be devised, for whenever the sitting posture is assumed the testicle is liable to injury. In the way of treatment I would suggest a horse-shoe truss fitted to the crutch, to keep the testicle upwards as much as possible, with the hope of ultimately closing the lower portion of the sac. Should this fail, operation may be resorted to, to replace the testicle in its normal position, as was successfully done by Mr. Annandale, and reported in the *British Medical Journal*, January 4th, 1879; but operative interference, if resorted to at all, can only be attempted when the scrotum is developed and not shrunken from the prolonged absence of the testicle. The results of cases show that the operation should be deferred until the patient is advanced in life, for when performed on children it has not met with sufficient success to warrant its adoption.

J. P., aged five months, from whom Fig. 3 was taken, suffered from misplaced testis of the right side. The left testicle was normally situated, the right was present below the scrotum, bulging in the perinœum and covered with ordinary integument. The right half of the scrotum was empty and

FIG. 3.



Misplaced Testicle of the right side.

contracted. The cord on the right side could be easily traced from the right inguinal ring to the testis in the perinæum, the cord lying to the outer side of the scrotum. The testicle could be passed upwards to the groin, returning, however, when pressure was removed; but it could not be

passed into its normal position, some constricting band bounding the margin of attachment of the scrotum, similar to the septum which separates the two testes, preventing it. No history of injury and child born naturally.

There are some forms of malposition of the testis occurring when it is situated in the scrotum; these are, inversion and reversion.

Inversion of the testis may be either partial or complete, the epididymis pointing to the thigh or septum scroti in the partial inversion, and being situated anteriorly in the complete; the free surface of the testicle in all cases looking towards the centre of the sac of the tunica vaginalis.

Inversion of the testis is stated to be of greater frequency on the right side, and is probably due, as in the former malposition, to some irregularity in the gubernaculum testis. The knowledge of its occurrence is important, for in cases of hydrocele or hæmatocele, if the situation of the testicle is not previously known, the organ might receive injury in the operation of tapping.

In reversion, the testicle is situated in its usual position, but the vas deferens springs from the upper instead of the lower end of the epididymis. For the description of this malformation we are indebted to M. Royet.

# CHAPTER III.

## ATROPHY AND HYPERTROPHY.

ATROPHY.—Atrophy, or the wasting of a testis once normal in size, may arise from several causes. An imperfect supply of blood will occasion atrophy, and in the testicle this is seen in cases of varicocele, where the dilated veins obstruct the blood in the contiguous arteries; also in cases of obliteration of the spermatic artery when it has been accidentally ligatured in the radical cure of varicocele; and the same cause and effect are seen in the notable case under Mr. Wardrop, where an aneurism of the aorta pressing upon both spermatic arteries produced their obliteration, and also atrophy of both testes.

The long-continued pressure of the fluid in cases of hydrocele or of the blood in hæmatocele leads to an atrophic condition of the testis, principally by impeding the supply of blood going to it; so also may the pressure arising from a scrotal hernia, a badly fitting truss or tumour

in contact with the spermatic cord. Elephantiasis of the scrotum produces atrophy of the testis by diminishing its vascular supply; the neighbouring growth taking away nourishment for its own maintenance as well as impeding the circulation to and from the testis by the enlargement of the lymphatics and its own inherent growth.

The testicle never atrophies from diminished activity; its function may remain for a long time dormant and yet retain its full power, whereas on the other hand an increased functional activity or excessive use produces wasting or atrophy in one or both organs.

Iodine does in some persons undoubtedly produce a shrinking in size of the seminal as well as of the other glands of the body; producing in the same patient great depression and also anaphrodisiac symptoms. That atrophy of the testis is produced by its use is probably incorrect, for on the discontinuance of the drug the glands in time resume their usual size and function.

The most frequent origin of atrophy of the testis is due to the remnants of old inflammation, and is said to be especially frequent after the orchitis following mumps, the contraction of the intertubular infiltration and organization of

ce inflammatory material pressing upon the minal tubules and causing their obliteration ad conversion into a mass of fibrous tissue. xcision of the tonsil has been said to cause bsorption of the testis of the corresponding de, but later research has proved that this is ot the case. Atrophy of the testicle follows ccasionally after the receipt of injuries to the ead and in cases of paraplegia or injury to the pine above the origin of the spermatic nerves. he region of the occipital protuberance has een looked upon as being the seat of philopro-enitiveness, but whether it is so or not is ques-onable. In favour of its being so are the ecords of cases where, after injury to the occi-ital region, failure of the generative powers has llowed in consequence; and in a case recorded y Mr. Levison the cerebellum was found atro-hied on the same side as the atrophied testis. Probably some locality of the brain is the seat f generative power, in the same manner as the eat of speech has been found located in the hird frontal convolution of the left side, and hat eventually this seat will be found to bear ome reference to the occipital region; a large ccipital protuberance according to some almost nvariably co-existing with large testes and *vice ersâ*.

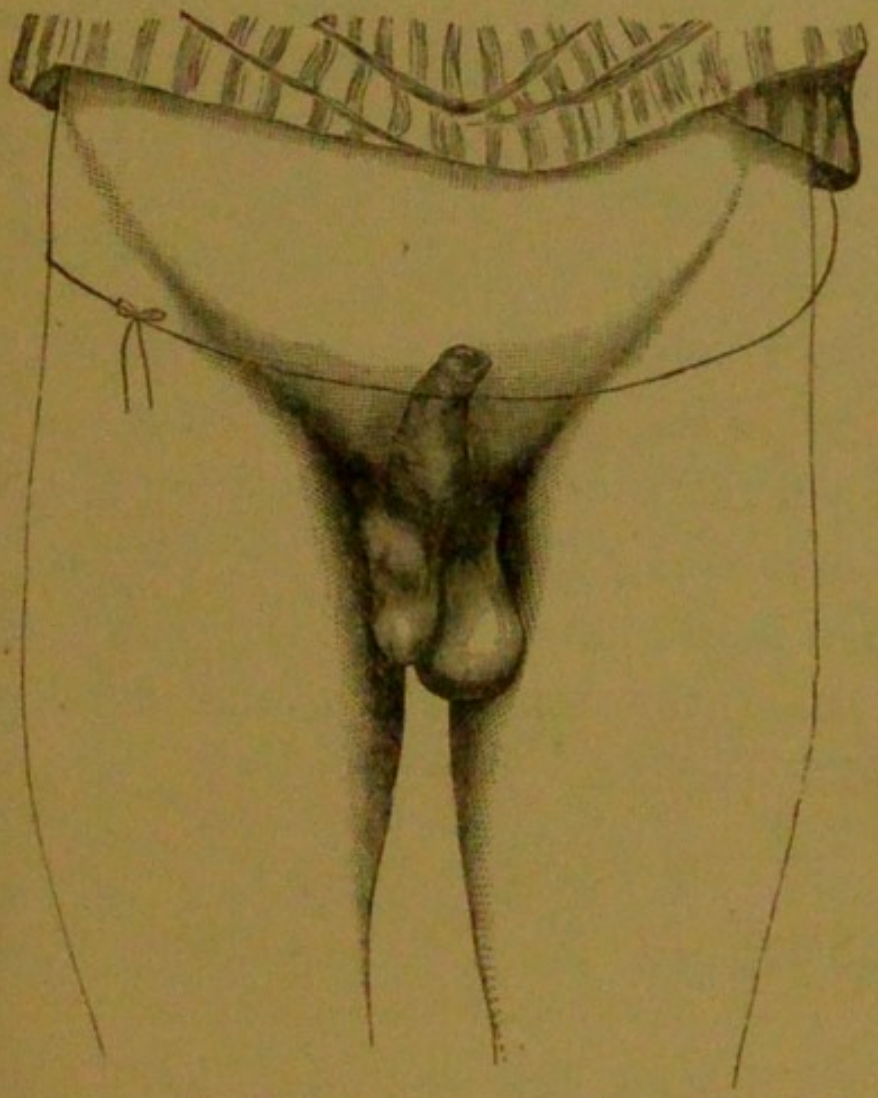
Allowing for the difference in size of the testes in diverse individuals and its variations in size at different periods in the same individual, the average weight of the testicle is from three quarters of an ounce to an ounce, the left being usually a little the larger. It is, however, quite possible for a testicle to be much below this weight and yet be of fecundative power. Mr. Curling considers a testis weighing less than three drachms to be in an atrophic condition. The testicle when atrophied as the result of disease is distinguishable by the irregularity in shape as well as diminution in size, but in other cases it retains its original contour, becoming soft and flaccid and with loss of all testicular sensation.

When examined after removal the testicle is found destitute of all spermatic granules, and frequently associated with the atrophic condition there is found, as in other parts of the body, more or less fatty degeneration. Nothing can be done to prevent or cure atrophy of the testis when once it has commenced; it is a local death of function attended by loss of substance. Atrophy should be borne in mind when treating any disease of the testis, and a long continuance of pressure arising from inflammatory products or other extraneous growth, is to be prevented

om acting injuriously upon the testis or parts volved in its integrity.

*Hypertrophy.*—Hypertrophy of one testis is casionally met with, and is compensatory for a

Fig. 4.



Compensative Hypertrophy of the Left Testicle.

eless condition of the other. The shrunken sticle may be the result of atrophy or the nsequence of arrest of development. The crease of function takes place consequent upon e total loss of the same upon the opposite side.

When examined there is found no increase in the number of the seminal tubes, but an increase in their size. Hypertrophy of the testis is very rare, more especially so when the opposite testis is atrophied, whereas that accompanying an undeveloped organ is the more frequent. An example of the latter was under the care of Mr. Clutton in the out-patient department of St. Thomas's Hospital. The patient—a boy of 14 years of age—had hypertrophy of the left testicle consequent upon an undeveloped condition of the right due to the pressure of a congenital hydrocele upon the cord. Fig. 4 is a representation of the case kindly lent me by Mr. Clutton. The specimen in the museum of the College of Surgeons is also the result of arrest of development of the left testicle.

# CHAPTER IV.

## EPIDIDYMITIS.

INFLAMMATION of the epididymis, or epididymitis, may be the result of extension of inflammation the vas deferens from the prostatic portion of the urethra, in which are situated the openings the ejaculatory ducts, or from inflammation rising in the vas deferens itself. Of the former, rethral inflammation arising from the passage of struments, lodgment of calculi, or gonorrhœa, is e usual cause; whereas of the latter, injury is ne source of origin, whether arising from a blow, queeze, &c., or pressure from the undue strength a truss. The two following cases are characristic:—

F. F., æt. 18, contracted gonorrhœa, which was ccompanied by marked chordee, the penis being rched, with the concavity to the left side. pididymitis and acute orchitis of the left sticle followed, the discharge abating when ne testicle became affected. There was also fusion into the sac of the tunica vaginalis.

The presence of the chordee on the same side as the subsequent epididymitis was indicative, in my opinion, of the inflammation being principally situated on the left side, and of the epididymitis being due to a transmission of inflammation by continuity.

S. F., æt. nine, had been supplied with a left inguinal truss on Oct. 23rd; the day following he complained of pain, and on the 25th noticed that the left side of the scrotum was swollen. The new truss was consequently discontinued on account of the pain, and the old one reapplied. When first seen, on Oct. 26th, he was in great pain, and could only walk with difficulty. The testicle was not swollen, but there was much thickening and tenderness of the left epididymis. No history of any injury. A left inguinal hernia was present, from which he had suffered one year and three months, and had worn a truss for the last twelve. After douching of left side of scrotum with cold water, and rest, the swelling went down the same evening very considerably, and on Oct. 28th it had entirely disappeared. A truss with a less strong spring being supplied, no further inconvenience resulted.

Epididymitis is undoubtedly most frequently due to gonorrhœal inflammation, and is cited as one of the best examples of metastatic inflamma-

tion; but I agree with those who look upon it solely as inflammation by continuity, and as spreading from the urethra along the vas deferens to the epididymis. It is usually found associated with first attacks of gonorrhœa, and in persons of a weakly or highly nervous temperament. On the appearance of the epididymitis the gonorrhœal discharge usually abates, or stops entirely, to recommence on the subsidence of the epididymitis; and this is consistent with what occurs in other parts of the body. "An inflammation set up in one part tends to relieve the inflammation existing in a neighbouring tissue." Probably the mode of treatment of a gonorrhœa has nothing whatever to do with the origin of consecutive epididymitis. Some surgeons have attributed the consecutive epididymitis to the use of unusually strong injections. This is incorrect, and the cause is to be found in a deficiency of the patient's physical strength, and where the scrotum is pendulous from sexual excess.

Curling and Bryant state that the right organ is affected more frequently than the left, the reverse being the case in hydrocele. According to my experience, I have found the right and left organs attacked with equal frequency; and, looking upon the epididymitis as an extension

of inflammation from the urethra, it is improbable that, except by chance, one ejaculatory duct, both being correspondingly situated, should become affected prior to the other. Both testes are but rarely affected, and the reason why only one testis becomes affected at one time, is that the congestion caused by the inflammation occludes the adjacent opening of the vas deferens on the opposite side.

The most frequent complication of epididymitis is acute hydrocele of the tunica vaginalis. This is accounted for by M. Gendrin's explanation, which I quoted when speaking of the visceral form of hydrocele of the tunica vaginalis:—"The constant participation of the subserous cellular tissue with the inflammation of serous membranes can be explained by the fact that the inflammation extends itself to the parts which it covers, and reciprocally; it also affords a reason for the limits that these inflammations meet with in their propagation. This proposition seems paradoxical, but it is nevertheless the consequence of facts. When the subserous cellular tissue extends into the contiguous organs and penetrates into its thickness, one perceives that it becomes the means of communicating the inflammation."

In other words, inflammation of the epididymis,

and of the cellular tissue binding together its convolutions, is readily communicable to the serous membrane or tunica vaginalis covering it, with the result of effusion of fluid into the tunica vaginalis.

The combination of acute hydrocele with epididymitis has been frequently mistaken for acute testitis, and has consequently been looked upon as a less frequent result than the extension of inflammation to the gland; such, however, is not the case.

In acute hydrocele the swelling is globular in form—tense, fluctuating on palpation and transparent by transmitted light—whereas in acute testitis the swelling is clearly a combination of orchitis and epididymitis, both parts being distinguishable, and, although swollen, retaining their original contour when compressed laterally.

Testitis, or inflammation of the seminal gland, as well as of the seminal duct, is the next most frequent complication; the orchitis being the consequence of the extension of the inflammation from the epididymis.

The pathology of epididymitis consists in the infiltration with inflammatory products of the connective tissue surrounding and binding together the convolutions of the epididymis, more especially of the lower portion, or globus minor,

and, as elsewhere, this inflammatory material may undergo resolution, organisation, or suppuration.

Formation of pus may occur as the result of a severe epididymitis, and, if not opened sufficiently early, will burst externally, giving rise to sinuses, and, occasionally, the formation of a spermatic fistula; whereas suppuration occurring in the body of the testicle and bursting externally usually gives rise to hernia testis.

A much more frequent result of epididymitis is a marked induration or organisation of inflammatory products to remain for a longer or shorter period after the termination of all inflammation, and may be the occasion of neuralgia testis. This induration, if not subjected to treatment, may become permanent, with one or other of the following results:—The canal of the epididymis may become dilated (Mr. Curling states) to four or five times its original size—possibly the result of adhesions occurring between the external wall of the canal and the tunica vaginalis; the canal may likewise become obstructed or obliterated, as in the inflammation of other channels, by bands of organised inflammatory material. This may occasion either atrophy of the testicle or orchitis (as in the case quoted by Mr. Bryant), which is due to the retention of seminal secretion, from the obstruction to the seminal duct.

As atrophy of the testicle may follow an attack of epididymitis, so double epididymitis may be the occasional cause of sterility.

The symptoms of epididymitis commence suddenly with severe pain and swelling of the epididymis extending up the cord. The fulness and tenderness is confined principally to the posterior part of the testicle, and more especially to the globus minor, where there is the larger amount of connective tissue. The epididymis thus swollen presents a half-moon shape, in the concavity of which is situated the body of the testicle. The scrotal structures over the epididymis also participate in the inflammation and are swollen and red.

The pain produces a peculiar sickly sensation and extends to the anal and iliac fossæ of the affected side. Associated with these symptoms there is always more or less constitutional disturbance consisting in nausea and vomiting, feverishness and constipation, varying in intensity according to the temperament of the patient.

The mode of treatment varies according to the exigencies of the case, but depends more especially upon the social condition of the patient. When complete rest and attention can be bestowed, cold applications are the best; an ice-bag should be kept constantly applied to the

inflamed epididymis, which should be supported by a cushion placed between the legs or by a band of strapping passed across the thighs, the patient being kept in the horizontal posture. To others the use of moist warmth, such as poppy or warm-water fomentations on spongeo-piline, are more agreeable. But for a labouring man to lay up is impossible, and consequently the scrotum must be supported by a suspensory bandage or folded handkerchief.

Antiphlogistics are called for in all cases, the mist. emolliens of the St. Thomas's Pharmacopœia, combining as it does a saline purgative with diuretics, answers the purpose well.

The administration of antimony so as to produce nauseating effects, at an early stage of the disease, is productive of the best results.

Mercury has been suggested in the acute stage, and also the use of pressure by strapping; both are, however, more applicable to the chronic stage, and the use of the latter is seldom practicable on account of its occasioning so great an increase of pain.

The application of leeches or the puncturing of the veins of the scrotum has been resorted to in cases of great pain, but I have never seen occasion to perform such an operation.

The complication of acute hydrocele with

epididymitis need make no alteration in the line of treatment, and tapping is not called for, the hydrocele disappearing as the inflammation which occasioned it subsides; the treatment being directed to the original cause of the disease.

Puncturing the epididymis is in my opinion unnecessary, although recommended by some and stated to relieve pain. If suppuration occurs in the epididymis, a free exit for the escape of pus should be made as soon as possible, to prevent the subsequent occurrence of sinuses.

Induration, which so frequently remains after epididymitis resulting from the organisation of inflammatory products, and tending to produce the serious consequences previously mentioned, is best treated by mercury or pressure, or both combined.

Mercury is known to produce absorption of inflammatory products, hence its use. It may be used in the form of the ointment rubbed into the groin or applied beneath strapping, and generally known as Scott's dressing, the application of ordinary strapping or the use of an elastic bag being the usual and most convenient methods of applying pressure to the swollen testicle.

## CHAPTER V.

### ACUTE ORCHITIS.

Acute Orchitis, or inflammation of the body of the testicle, may be caused primarily by injury applied directly to the testicle, as from a blow or squeeze; or secondarily by the transmission of inflammation from the epididymis or seminal duct, and consequent upon the same causes which originate that disease. The combination of inflammation of the seminal duct or epididymitis with inflammation of the body of the testicle or orchitis, being generally spoken of as testitis.

As one of the sequelæ of gonorrhœa, acute orchitis never takes place without a primary epididymitis; although some surgeons are of opinion that it does occasionally do so, and look upon it as being allied to the inflammation of fibrous tissues, and partaking of the nature of gonorrhœal rheumatism.

Others believe the inflammation of the testicle is due to the retention of secretion on account of the occlusion of the opening of the vas

eferens by the urethritis. Acute orchitis is sso said to arise spontaneously, as when asso- ated with parotitis or mumps, and is looked pon as an example of inflammation by meta- asis. This is questionable, and will probably be coved to be fallacious, just as acute orchitis pervening on gonorrhœa is now known to be ue, not to metastasis, but to continuity of in- ammation from the urethra through the open- g of either vas deferens to the corresponding pididymis. The similarity of diseases affecting ae parotid and the testicle is very striking; for esides the above association, the following nalogous diseases are found in both organs:— nchondroma, encephaloid cancer, fibrocystic and ther encysted tumours.

W. F., æt. thirty-eight, a married man, caught umps from one of his children, of whom he ad three, all girls. The right parotid and right sticle were affected. The testicle became wollen one week after the commencement of the arotid swelling, and as the inflammation was bsiding, which it did gradually and not sud- enly. The swelling of the testicle was preceded y pain in the thorax and severe pain in the odomen. Under the treatment of warm flannels ver the testis, rest and opening medicine, the welling subsided; but for some little time after-

wards he complained of slight pain in the region of the groin and pain in the right loin simulating unilateral lumbago.

T. G., æt. seventeen, suffered from double parotitis, the right side being first and chiefly affected. The swelling of the testicle was also on the right side, and appeared as the mumps were subsiding. The patient suffered from pneumonia at the same time. He was treated by leeches and strapping. During convalescence he suffered from pain on the right side, shooting up into his back.

Comparing these two cases, the following symptoms are identical in each. The orchitis appeared as the parotitis was gradually subsiding and was also situated on the corresponding side of the body. The severe pain in the thorax and abdomen of the one case, and the pneumonia in the other, suggested a communicating link of inflammation between the two organs. The presence of the orchitis on the corresponding side as the parotid swelling is noticeable also in the case quoted by Sir Astley Cooper at page 136 in his work on "The Structure and Diseases of the Testis," where in the case having double parotitis there was double orchitis, and in the other the affection was on the right and corresponding side. it probable that the inflammation takes place by continuity of inflammation, and if so is it by

means of the fascia or by the lymphatics? The presence of a communicating link by which the inflammation might possibly be traced from one organ to the other is in favour of inflammation by continuity; and this theory is supported by the occasional occurrence of its transmission to the membranes of the brain, as quoted in the *London Medical Gazette*, 1851, page 651, where death occurred from meningitis supervening on mumps. Again, in another case which came under my notice, of an unmarried woman, aged thirty-two, parotitis was associated with mammitis on the corresponding side, the gland being indurated and very painful without any catamenial irregularity. The percentage of cases of mumps, in which the combination of acute orchitis is present, is about one in fifty.

The body of the testicle is affected by inflammation much less often than the epididymis, the firmness of the tunica albuginea and the sac of the tunica vaginalis affording it protection.

When inflamed the cellular tissue holding together the tubuli seminiferi becomes infiltrated by the effusion into it of inflammatory products, which may either become absorbed, suppurate, or undergo organisation. Suppuration is a less common sequence to acute orchitis than to epididymitis; and should the pus find its way

externally, hernia testis, or the protrusion through the fistulous opening in the scrotum of some of the gland structure covered with granulations, is the result; but when an abscess in the testicle is opened sufficiently early, hernia testis is not so likely to occur. Occasionally the pus becomes encysted, the presence of a distinct cell wall being the point of distinction between this and tubercular deposit, which it somewhat closely resembles.

Gangrene has once resulted from acute orchitis, the case being the well-known one which was under the care of Mr. Stanley, and cited by Mr. Ludlow in his Jacksonian Essay.

Organisation is a very common result of acute orchitis, the acuteness merging into a chronic condition. The organisation of the inflammatory material on the one side, and the unyielding structure of the tunica albuginea on the other tends, if the former be of long duration, to atrophy of more or less of the secreting structure situated between them. Under proper treatment such a result seldom occurs, and although it was considered a frequent result of the acute orchitis following mumps, it is probably not more frequent in this than in orchitis from other causes.

With respect to symptoms, there is little fear of mistaking them; the testicle is enlarged, but still retains its oval form with flattened sides. The

ain which extends along the cord up to the
oin is very severe, and usually more acute than
hat in epididymitis, because the tunica albu-
inea or fibrous envelope of the tubuli seminiferi
revents the free expansion of the inflammatory
naterial. The scrotum participates in the in-
ammation beneath, and is swollen and red.

Constitutional symptoms more or less severe are
lso present, the patient being sick and feverish
nd the bowels confined. In very severe cases
ome effusion of fluid into the tunica vaginalis
kes place, the areolar tissue connecting the
unica albuginea and tunica vaginalis being the
onducting medium, but on account of the paucity
f the areolar tissue in this situation as compared
ith that connecting the ramifications of the
pididymis such a complication is notof so frequent
ccurrence as in epididymitis. The tunica albu-
inea is also a less favourable medium for conduct-
ng inflammation. As to the frequency of the
ight and left side being affected the remarks
nade with regard to epididymitis apply equally
o acute orchitis occurring secondarily to that
isease. When the body of the testicle is pri-
narily affected and of traumatic origin, the testicle
which receives the injury is a matter of chance,
he left testicle, hanging the lower, being probably
he more likely to become injured.

The treatment of acute orchitis is identical with that of epididymitis. Rest in the horizontal posture, with the local application of an ice-bag, or, if preferred, of warm fomentations, and the administration of saline purgatives being all the treatment required.

Puncturing the testicle is advocated by some, and is likely to relieve the tension of the tunica albuginea and consequent pain, but the operation itself is necessarily a very painful one, and the swelling and pain diminishing quite as quickly under local applications it is unnecessary, and "founded on wrong views in pathology."

# CHAPTER VI.

## SIMPLE SARCOCELE.

CHRONIC inflammation of the body of the testicle may be the consequence of a prior acute orchitis stricture of the urethra, of vesical calculus, or sse spontaneously from a gouty or strumous athesis. Excluding epididymitis and orchitis the sequelæ of gonorrhœa, simple sarcocele is e most frequent of diseases of the testis.

The pathology of chronic inflammation is nilar in many respects to that of the acute, the ference being in intensity and mode of termi- tion, for simple sarcocele is slow and insidious its progress, and its mode of termination usually towards organisation, but it may also d in resolution or caseous infiltration.

The infiltration of the cellular tissue by granu- ion or indifferent cells takes places external to d around the seminal tubes; this intertubular iltration affecting either the whole or only a rtion of the areolar tissue of the gland proper.

When the whole of the gland is diseased testicular sensation is absent, returning again as the organisable material becomes absorbed. The epididymis and cord are also sometimes affected, and in all cases of simple sarcocele the cord should be carefully examined, for in those instances where it is at all thickened the cause of the testicular enlargement will usually be found to be due to some urethral or vesical irritation.

If the infiltration is of long standing, the tunica albuginea and fibrous septa become thickened and indurated, and the future usefulness of the gland involved, for the seminal tubes long compressed by the inflammatory exudation become atrophied and useless. Virchow states that when the disease is of long standing, the inflammation may also communicate itself to the tubules, the walls of which become thickened and finally undergo fatty degeneration.

In persons of a strumous or weakly constitution the inflammatory exudation is of the same character, but on account of the less degree of vitality the products of inflammation break down and end in the formation of pus; and suppuration having once taken place the pus will either become encysted, undergo caseous or calcareous infiltration, or make its way externally and terminate in hernia testis.

The chronic orchitis, which is due to gout, holds an intermediate position or connecting link between acute and chronic inflammation; the gouty origin being identified by symptoms which are characteristic. The pain is of a more acute form, and is intensified at night-time; the patient having in addition the dyspepsia, high-coloured urine, and irritable temperament, always found associated with the gouty diathesis. Both testes are usually affected, and if not there is usually some shooting pain to be found in the one not enlarged.

Some effusion of serum may take place into the tunica vaginalis, more especially in the gouty form, where the intensity of the inflammation is more acute. The commencement of an attack of chronic orchitis, except when occurring as a sequence to the acute form, is almost imperceptible, the swelling not being perceived until the testicle is noticeably much larger than the other. Pain, then, of a dull aching character, extending up to the loin, due principally to the weight of the enlarged testicle, is then complained of. Testicular sensation present at the commencement disappears during the greater severity of the disease to return again when the inflammatory exudation shall have become absorbed, but in those cases where the disease has continued for a long

period it never returns. The surface of the testicle always presents a uniform smooth surface, and feels of a stone like hardness. The enlargement is never excessive, being about twice that of its original size. The body of the testicle and the epididymis are merged into one swelling which is compressed laterally, and retains the original contour of the testicle. Should hydrocele be combined with the sarcocele, the usual pear-shaped form of the former obscures the enlarged testicle and makes the diagnosis one of more difficulty.

There is little or no constitutional disturbance except that previously spoken of as occurring in the gouty form, and in the strumous variety of the usual concomitants found in scrofulous children.

Syphilitic sarcocele is to be diagnosed from simple sarcocele by the presence of signs of old syphilitic mischief, such as scars, and coppery brown discolourations of the skin. In some cases the previous history will at once give the clue to the originating cause, but in several undoubted cases of syphilitic sarcocele, it is often impossible to eliminate from the patient any knowledge of previous sore.

In cancer of the testicle the enlargement is always more considerable than in simple sarcocele

and the outline never so smooth and regular, and the glands in the groin are occasionally affected.

Hydro-sarcocele is not unfrequently mistaken for vaginal hydrocele, and the true nature of the complaint only recognised after tapping, when the testicle itself is found to be enlarged. The previous history will occasionally show that the testicle was first swollen; but when examined by transmitted light prior to tapping, at the same time as the position of the testicle is noted, the presence of any enlargement should not fail to be diagnosed also.

If taken in time, there is no disease more amenable to treatment; but if allowed to run on for some length of time before advice is taken, the course of treatment is protracted, and ultimate cure doubtful. In simple sarcocele the exhibition of mercury is attended with great advantage, one drachm of the ointment being rubbed into the groin of the affected side night and morning. It is well to combine with this treatment the administration of a mixture of Pot. Iod. grs. v. with Dec. Cinchonæ, three times a day. In some cases five grains of blue pill, combined with a quarter of a grain of opium, may be administered twice daily, but the former treatment by inunction is to be preferred.

Strapping of the testicle is attended with the best results, combined or not with the application of mercurial ointment; the pressure of the strapping, or of an elastic bandage, being the more important factor.

To strap a testicle, the scrotum on the affected side should be closely shaven—an important point, as regards the comfort of the patient, when the strapping has to be removed, which it should be, and reapplied, every two or three days. The affected testicle, having been isolated by the finger and thumb of the left hand, a band of strapping one inch in width is passed circularly around the cord just above the testicle; bands of strapping of corresponding width are then passed at right angles to the first piece, enclosing the testicle from behind, forwards and upwards, one band overlapping the other until the whole testicle is covered in. A final piece of strapping is then passed in a corresponding manner to that first applied, to retain the ends of those previously passed, at right angles.

The remarks made before as to the treatment of hydrocele when associated with epididymitis are equally applicable in hydrosarcocele, for the hydrocele will disappear as the affection of the testicle subsides. Injection of iodine should never be performed, and tapping is seldom called for

except for the closer and better adjustment of the pressure when strapping is determined upon.

In the sarcocele of strumous children (found principally in hospital out-patient practice), mercury should not be given; tonics, such as steel wine, the syrup of the iodide of iron, and good living, being the best mode of treatment. These cases of sarcocele occurring in strumous children are those which most frequently develop tubercle, or run on to hernia testis; and in a little patient who had hernia testis on both sides at different periods, got well solely by the better living which he obtained as an in-patient of the hospital.

In gouty sarcocele, also, mercury should not be given, alkalies with colchicum being called for, with better regulation of the diet, and the avoidance of all saccharine and highly-seasoned food. Unfortunately this form is the most tedious in cure and the most liable to recurrence.

## CHAPTER VII.

### SYPHILITIC SARCOCELE.

Syphilitic sarcocele is a chronic inflammation of the body of the testicle, but differing from simple sarcocele in certain peculiarities characteristic of the disease. There is a like infiltration of texture by inflammatory material, showing a corresponding disposition to undergo organisation, but the inflammatory lesions are characterised by greater diversity in size and irregularity in distribution.

The testicle may be affected by syphilis, as may any other organ of the body, those parts becoming affected which are the more weak, and consequently the less likely to withstand the syphilitic virus; for it is in those persons who, if affected with gonorrhœa, develop secondary disease of the testis, would, if affected with syphilis, develop subsequently syphilitic sarcocele, showing that the organ is weak and necessarily liable to become affected.

As the pathology of constitutional syphilis

comprises two varieties—viz., the fibroid induration and the syphilitic gumma, so in the testicle are found two varieties of syphilitic sarcocele.

The first, or fibroid induration, is usually seen during the secondary stage of syphilis, and is found associated with periostitis and other fibroid changes in the capsule and interstitial tissue of organs. A small celled infiltration, showing a greater or less tendency to become fibrillated, takes place irregularly in the capsule of the testicle, producing consequent thickening and irregularity of its surface. The fibrous septa radiating from the tunica albuginea are also correspondingly affected. The inflammatory condition of the tunica albuginea readily communicates itself to the visceral layer of the tunica vaginalis, either producing adhesions between the visceral and parietal layers of the tunica vaginalis when they are in close approximation, or, when separate, effusion into the sac of the tunica vaginalis and formation of hydrosarcocele. From the mediastinum testis are given off septa of connective tissue radiating to the circumference, thus dividing the testicle into conical compartments in which the convoluted seminal tubes are located; inflammation in some of these partitions and not in others accounting for the irregular contractions found in syphilitic sarcocele.

The second variety or syphilitic gumma is found later in the course of constitutional syphilis, belonging to the stage when the tendency to ulceration and suppuration is more marked, and associated with which are rupial affections of the skin, and caries and necrosis of bone. The cellular tissue of the body of the gland between the seminiferal tubes is seen interspersed with numerous yellowish-white nodules, irregular in distribution and varying in size from a hemp-seed to a pigeon's egg. Examined microscopically, they are found to consist of indifferent cells undergoing disintegration, surrounded by an incompletely fibrillated tissue, having the appearance of a capsule, but which is intimately connected with the surrounding structure. The capsule of the testicle not being affected, the surface of the testicle is smooth.

In these two varieties there are certain symptoms peculiar to each, and others common to the two. The first is characterised and easily distinguishable by being nodular and irregular at first, but subsequently consisting of a uniform enlargement. It is this variety which is the more frequently associated with hydrocele, the diseased condition of the tunica albuginea communicating itself to the tunica vaginalis. Pain over some particular spot is occasionally detected on manipulation. If subjected to treatment at

an early period a favourable prognosis may be given as the disease usually terminates in resolution; but if of long standing, atrophy of the testicle results. The second variety is perfectly smooth in outline, and consists of an enlargement of some portion of the testicle forming a distinct tumour, and when near the surface budding as it were from the body of the testicle with a broad base. The enlargement is of a painless character, and may remain quiescent for a time and undergo resolution, but like other gummata may break down, suppurate, and forming adhesions with the scrotal covering, end in hernia testis or an ulcerating wound of serpiginous character.

In both varieties there may or may not be found other signs of constitutional syphilis; more frequently than not there are such in the form of copper-coloured scars, even if there be no signs of more active mischief. The gland is always of a stone-like hardness; testicular sensation disappearing to return as the enlargement subsides. Pain is not unfrequently entirely absent, or that of a dull heavy character from the increase of weight, increase of size being the first symptom noticeable. Pain, shooting up to the anterior superior spine of the crest of the ilium and round to the loin, is not unfrequently

complained of as the enlargement of the testicle is subsiding. Both testicles may become affected at different periods, but seldom both at the same time, and when once affected a recurrence is not infrequent. Diagnosis between the first variety of syphilitic sarcocele in an advanced stage and simple sarcocele is one of great difficulty, and if all history and other unmistakable signs of old syphilitic mischief are absent, impossible.

When speaking of the treatment of simple sarcocele, the great advantage to be obtained from the administration of mercury was mentioned; but more especially in the treatment of the syphilitic variety is mercury indicated, in what manner or form is a matter of choice. Some surgeons prefer the ordinary blue pill grs. iv., with a quarter of a grain of opium or the mercurial suppository three times a day; but I prefer the rubbing into the groin on the affected side, night and morning, of the ordinary blue ointment, the effects of which are highly satisfactory. After a time the mercury produces an irritation of the skin, when its use may be discontinued, as its effects are never required to be carried to a great extent. This treatment may be combined or followed up by the administration of iodide of potassium in three to five grain doses, and in cachectic patients, where

ercury cannot be given, its sole use, or that of
ae syrup of the iodide of iron with infusion of
entian, is beneficial.

Iodide of potassium again in some produces
ach severe coryza and extreme depression that it
annot be tolerated, and in these cases may be
ven the decoction of sarsaparilla or a mixture
the perchloride of mercury with tonics.

Recurrence, which is not infrequent, is best
revented by keeping up the action of the mer-
ury for some little time after the subsidence of
ae enlargement.

The secondary hydrocele, which is so fre-
uently associated with syphilitic sarcocele,
equires no especial treatment; for as the latter
ndergoes cure the former disappears. When
peaking of hydrocele it was stated that all
arieties of the disease which are of visceral
rigin require the treatment of the original
ause, and not of the hydrocele itself, which is
nly secondary, just in the same way as a dropsy
f the extremities is often secondary to disease
lsewhere, say, of the kidneys, heart, liver, &c.,
n which case the original cause and not the
onsequence has to be the subject of treatment.

Tapping of the hydrocele may be resorted to
s a means of diagnosis, the effusion of fluid into
he tunica vaginalis obscuring the enlargement of

the testicle. When the second variety, or syphilitic gumma has broken down and formed with the scrotal coverings a serpiginous ulceration, rest and good living, combined with syphilitic treatment, is generally sufficient; in some cases pieces of lint smeared with the red oxide of mercury placed in the ulcerated spots hasten the granulating process.

# CHAPTER VIII.

## TUBERCULAR SARCOCELE.

UBERCULAR testis must be understood to be dis-actly apart from strumous testis, for although bercle may take its origin in a chronically flamed testis, every strumous testis is not bercular.

'Tubercle may affect the testicle as well as her organs of the body, occurring either as a condary process upon a former orchitis, or ising *de novo* as a pathological neoplasm.

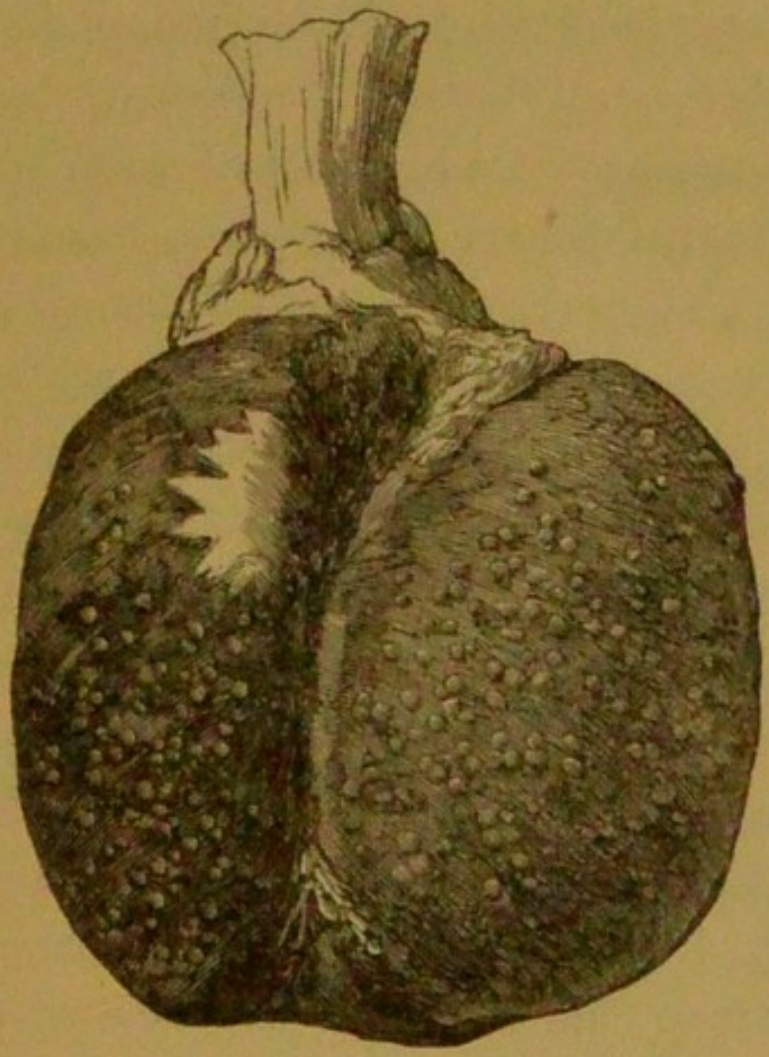
'The first variety is by far the more frequent the two. The orchitis to which the tuber-losis is the sequel may be of any form which ows a tendency to terminate in caseous dege-ration, such degeneration being strongest in rsons of a feeble and delicate constitution. ne testes of strumous children, when inflamed, e more particularly subject to a profuse cell rmation and subsequent caseous degeneration; nd it is on this account that consecutive tuber-losis is so frequently developed in these cases.

This form is seen in one or numerous patches of a yellow colour, varying in size and scattered in different parts of the epididymis, or body of the testicle; these patches tending to produce, by their growth, atrophy of the glandular structure, and by the coalition of neighbouring deposits to obliterate the entire glandular structure of the testis. Taking origin in a primary orchitis the intertubular structure is primarily involved the small-celled infiltration undergoing caseous degeneration, is followed by the subsequent development of tubercle, both as an inter- and intra-tubular infiltration, so that after removal it is impossible to decide whether the disease is originally one of deposition of tubercle in areolar tissue or in tubular structure.

The second form of tubercular sarcocele is where the tubercle arises *de novo*, and appears in the form of characteristic small grey nodules about the size of millet seeds, and from which the disease takes the name of miliary tuberculosis. These nodules, never large in size, are studded uniformly over the testis, and are not appreciable by any outward manifestation; but their presence is to be suspected by the rapid disorganisation which takes place after some injury. The nodules enlarge by proliferation of the cells at their exterior, and the cells composing them at

bheroidal in shape, and occupy the connective ssue as an intertubular infiltration. The cells re at first separated from one another by a ansparent matrix, which subsequently becomes orillated, and in the meshes of which these cells re imbedded. This variety is generally asso- ated with the deposition of tubercle in other rgans.

Fig. 5.



Tubercular Disease of Testis.
Prep. E. E. 24², St. Thomas's Hospital Museum.

Tubercle may also arise as an intratubular nfiltration, consisting of a proliferation of the

epithelial cells normally lining the seminal tubes. The areolar tissue becomes secondarily involved, but never to so great an extent as when primarily affected; and it may ultimately become indurated, as the result of chronic inflammation, or absorbed, the consequence of pressure.

The irregularly-placed yellow patches may become calcified, or undergo fatty degeneration in their centre, and an abscess result. Pus, when once formed, gradually makes its way to the surface, and the scrotum becomes adherent to the testicle. The bursting of these abscesses, when situated in the epididymis, usually terminate in sinuses from which ill-formed pus, and not unfrequently semen, is discharged, but when situated in the body of the testicle, terminate in hernia testis.

Tubercular sarcocele has generally an inflammatory origin, and is very frequently associated with phthisis or tuberculosis elsewhere, and which may have been the source of infection. The testicle may be diseased, and not the epididymis, but more generally it is the epididymis which is solely and primarily affected, the testicle becoming so subsequently; and, looking upon the development of tubercle in the testicle as being due to the distribution of infective materials, it is probable that in the epididymis they would be primarily

dged. The vas deferens may be similarly fected with tubercle, the disease sometimes ttending along its whole length.

Hydrocele is rarely present, but when it is the moval of the fluid by tapping has frequently be resorted to before the true nature of the sease is diagnosed. Tuberculous sarcocele is ost frequently met with at puberty, but may seen even in children, and less frequently in l persons. Both testicles are usually diseased, tt one, being affected prior to the other, is nsequently the more advanced in disease. The lcification of tubercle must be looked upon as most favourable termination, and, were any eans known of producing such a result, it ould be adopted. But, either on account of patient's health becoming debilitated, or as result of some injury, these masses of tubercle oner or later break down, and an abscess is med.

The presence of this disease may remain for a g time unobserved, the testicle being but slightly reased in size; or it may be accidentally de- ted by the observance of a small hard lump, ing like a pea, situated in the substance of epididymis. In some cases the whole of epididymis is nodular, with the body of the icle sunk in its enlarged and crescentic form;

or the body of the testicle may be likewise affected, and is consequently enlarged, and its surface rendered uneven. There is no pain or tenderness until suppuration commences in one of the nodules, then the skin over it becomes inflamed, and the presence of fistulæ or hernia testis follow. Testicular sensation remains as long as any secreting structure is present.

Tubercular sarcocele is distinguished from simple sarcocele by the irregularity of its surface, and by the epididymis being usually the part solely affected. In malignant sarcocele there is absence of all testicular sensation, and one organ only is involved; there is also greater rapidity of growth, and the enlargement is one of the body of the testicle and not of the epididymis.

In its earlier stages, as soon as discovered, rest, good living, and change of air are most serviceable. The treatment of tubercular disease elsewhere is equally applicable to the present complaint, the chief object being to keep up good health in the patient by the use of tonics, such as iron, quinine, or cod liver oil. Cold douching of the scrotum night and morning, and its suspension during the day by means of a bandage, should be adopted, and the patient ordered to abstain from all sexual indulgence.

When an abscess has formed, the sooner it is opened the better, as thereby the formation of sinuses from the epididymis, or a hernia from the body of the testicle, is prevented; but should they be present, with care and proper treatment they may eventually close, and it would be unjustifiable to remove the organ as long as any portion of the secreting structure remains, and its function can be carried on. Should the testicle be completely disorganised, or by its presence debilitate the patient, and thus tend to increase or give rise to disease elsewhere, excision should be performed. Symptoms of tuberculosis in other parts of the body need be no hindrance to this operation, as frequently marked improvement in health follows the removal of the testis, the presence of which is a drain upon the system.

*Hernia Testis.*—Hernia testis is not a special disease, but a symptom common to several diseases—viz., orchitis and syphilitic and tubercular sarcocele. The reason of its description and treatment being appended to this chapter is on account of its occurring with greater frequency in cases of tubercular sarcocele.

An abscess having once formed in the body of the testicle, its contents, if not absorbed, are finally discharged externally by the scrotal covering becoming involved in the inflammation.

Through the opening by which the pus was discharged is everted the abscess cavity, covering more or less of the seminiferal structure, the amount of which corresponds to the size of the opening; so that in cases having a large opening the whole testicle and mediastinum may be extruded.

The occasion of this eversion is due to the contractility of the tunica albuginea; for an abscess occurring in the epididymis is not followed by hernia testis, as is the case when the body of the testicle is affected, showing that the tunica albuginea is the cause of the protrusion.

A reddish-coloured tumour, consisting of more or less seminiferal structure covered with the irregular granulations which previously lined the interior of the abscess cavity, is seen protruding from an opening in the scrotum, the margin of which is clean cut and in no way involved, but sometimes indurated from inflammatory action.

The remains of the testicle situated in the scrotum varies in size according to that of the hernial protrusion, the sum total of the two but little exceeding, if at all, the size of the unaffected testicle. Some fear is frequently entertained of mistaking this affection for one of malignancy, but in malignant sarcocele the comparison of the

volume of the affected side is always much in excess of that of the healthy testicle. In malignant sarcocele there is also entire absence of testicular sensation, and the margin of the opening in the scrotum is not clean cut, but always involved by the infection of the cancerous material. In the hernial protrusion occurring in scrofulous children the improvement of diet which hospital residence affords is usually sufficient for the cure, as in the case previously mentioned.

Pressure by strapping, with the application of the red oxide of mercury ointment to the granulating surface, hastens very considerably the healing process by assisting in the return of the gland to its everted cavity.

Professor Syme has recommended an operation having the same object in view. The margin of the opening in the scrotum is enlarged and its edge pared; the two sides of the opening are then brought together over the hernial swelling and kept in position by sutures. The granulating surface subsequently becomes adherent to the internal lining of the scrotal sac. The protruding mass has by some been cut away previous to this operation, in order to facilitate its accomplishment; but such a proceeding is a most unjustifiable one, as in many cases the

whole of the testicle structure being extruded the operation is equivalent to excision.

Another operation, recommended by Dr. Pagan, is the division of the constricting ring of the tunica albuginea, allowing for the return of the hernial protrusion of the testicular structure as in the operation of herniotomy.

# CHAPTER IX.

## FIBROCYSTIC SARCOCELE.

Fibrocystic disease of the testicle resembles the similar disease occurring in the mammary, but even more closely that in the parotid gland.

It is called fibrocystic because sometimes more of the fibrous element is present and sometimes more of the cystic; and it may also vary from one with an admixture of cartilage to a pure enchondroma of the testis.

In the pathology of fibrocystic sarcocele much difference of opinion has arisen as to the structure in which the disease takes origin. Sir Astley Cooper describes it as being a disease of the seminiferous tubes. Mr. Curling looks upon it as a dilatation of the ducts of the rete testis, and others in its being an entirely new growth. The two latter are probably both correct.

Primarily the affection is probably a new growth, and commences by a cellular infiltration of the intertubular connective tissue, which, becoming fibrillated, leads to an increase of the

connective tissue between the tubes of the rete testis; some of the cellular infiltration situated farthest away from the blood vessels breaking down to form cysts, containing indifferent tissue, which may subsequently go on to the formation of a matrix and development of cartilage or even bone. Cysts are also probably formed by the dilated tubes of the rete testis owing to the unequal pressure to which they are subjected by the new growth, thus accounting for the occasional presence of cysts lined by a tesselated epithelium as described by Mr. Curling.

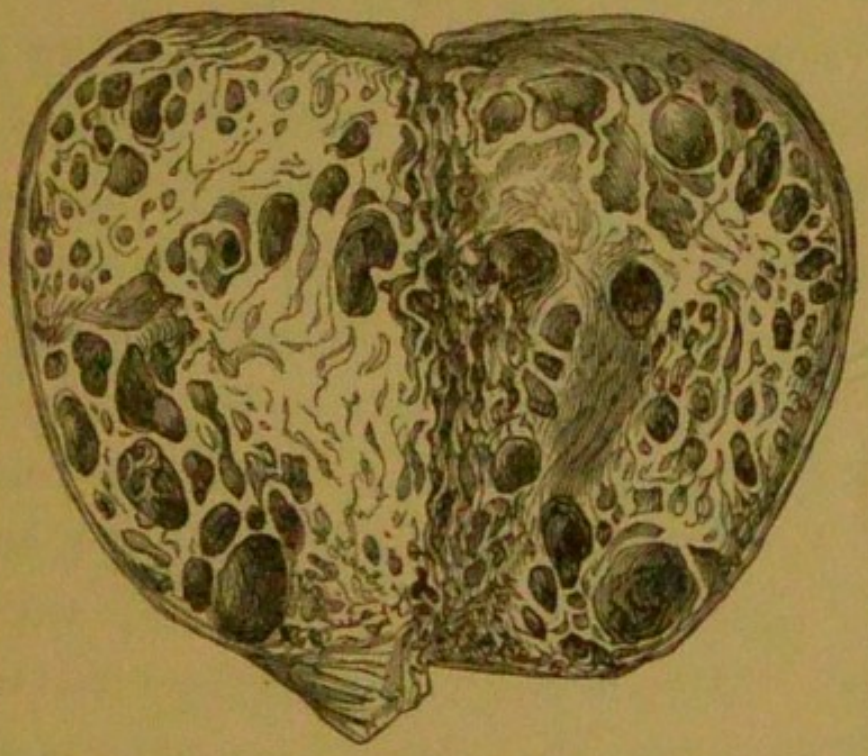
The cysts situated in the fibrous stroma may be more or less numerous, and vary in size from that of a millet-seed to an ordinary marble, and sometimes they are multilocular in character, with intracystic growth. The contents of the cysts, welling up on section, may be serous in character, whereas others contain a cheesy substance varying in colour from white to a deep red, from the admixture of blood, and which, under the microscope, exhibits an indifferent tissue; and which, if allowed to go on for a greater length of time, would assume the more definite structure of hyaline cartilage. Spermatozoa are not found in any of the cysts.

The disease is not diffused throughout the testicle, but takes origin from one point, and

that is usually the mediastinum testis; but occasionally it arises elsewhere, and pushing the seminal cones before it, the testicle structure remains healthy but spread out over the tumour which is encysted and quite distinct in its capsule from the seminal cones. Eventually the glandular structure becomes absorbed by the pressure to which it is subjected, and finally the epididymis also.

The disease is usually confined to one side, and the body of the testicle is the part affected,

Fig. 6.



Fibrocystic Disease of the Testicle.
Prep. E. E. 31, St. Thomas's Hospital Museum.

not the epididymis. It is usually met with in persons between twenty and fifty years of age.

The swelling assumes an oval enlargement with either a smooth or bossy surface. The cord is free and not enlarged, and the glands in the groin are healthy. It is of slow growth, and there is an absence of all constitutional symptoms. The affection is primarily painless, but as it increases in size the pain assumes a dragging character, occasionally shooting up the groin into the small of the back, and increased when standing or walking.

The pain and fulness may be relieved by coition, showing the testicle to be still of fecundative power, and testicular sensation present at first gradually disappears as the secreting structure becomes atrophied by the growth. There is a feeling of obscure fluctuation, and when combined with the presence of some projecting cyst, giving transparency by transmitted light, the diagnosis from hydrocele becomes one of some difficulty, and in some cases the diagnosis cannot be accurately affirmed until corroborated by the puncture of the enlargement with the trochar. In a Case recorded by me in the *Lancet* of 1877, the above particulars are well exemplified.

Constitutional treatment or local applications are of no avail in this complaint, and excision should be performed when the largeness of size

causes dragging and uneasiness from its weight. Enucleation of the tumour from the secreting structure has been suggested, and where only one testicle is present might be attempted; but the results are not in favour of this operation except under the above circumstances.

# CHAPTER X.

## MALIGNANT SARCOCELE.

Carcinoma may affect the testicle in either the scirrhus or encephaloid form, the latter being by far the more frequent. If examined at a sufficiently early stage of the disease, the cells are found to take origin in the connective tissue between the tubuli seminiferi, either appearing as an isolated mass or in separate centres, which subsequently coalesce. The secreting structure of the testicle being at first pushed aside by the new growth, which is not encapsuled, is finally involved, so that the entire testicle is replaced by a cancerous mass; and in past time, when the disease was allowed to run on for some time before removal, the tunica albuginea gave way, the scrotum ulcerated, and fungus hæmatodes resulted. The disease is now diagnosed and removed prior to this stage of advancement.

The cells are of the epithelial type, nucleated and of irregular size, and grouped within the

alveoli of a fibrous stroma, which is probably formed by the hypertrophied connective tissue and fibrous septa given off from the mediastinum testis. Scirrhus having a larger amount of the fibrous element is consequently slower in its growth, whereas the encephaloid or soft variety is characterised by a greater abundance of epithelial elements and greater rapidity of growth.

Cysts are frequently present and are developed in the same manner as in fibrocystic disease, but are filled instead with a creamy cancer fluid or with a yellow oily matter from fatty degeneration of the cancer cells. Some of the cysts contain masses of coagulated blood from the giving way of the blood vessels situated in the stroma, and others again contain cartilage or serum. Carcinoma develops itself usually in the body of the testicle, but there are some rare instances in which the epididymis was primarily involved.

The epididymis and cord gradually become implicated, however, as the disease progresses. The lumbar glands become enlarged by the absorption of cancerous material by the lymphatics, and ultimately the whole chain of the lymphatic system becomes infected. The inguinal glands frequently escape infection, although it is not

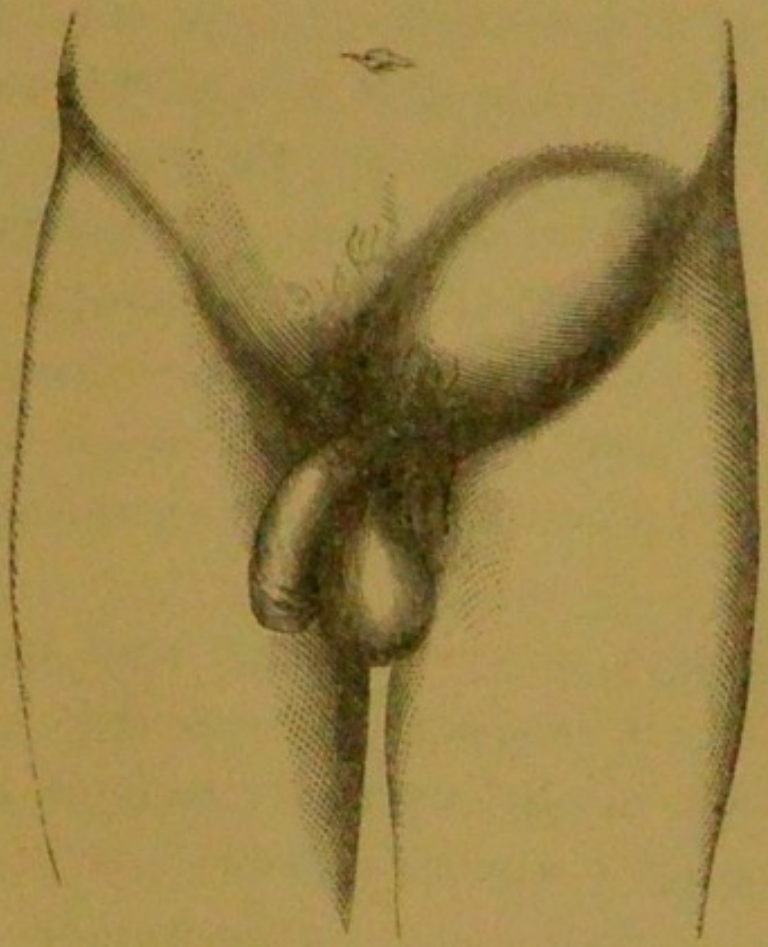
necessary for the skin to become implicated prior to their enlargement.

Malignant sarcocele may be met with in infants of only a few months old, but is generally found in persons between the ages of thirty and forty. The disease commences by a gradual enlargement of the testicle, which at first retains its oval shape with flattened sides, the surface remaining smooth and firm, and generally unaccompanied by pain. Absence of all testicular sensation occurs early in the course of the disease. But as the enlargement progresses, generally with great rapidity, the surface becomes uneven, with a preternatural hardness and sense of weight. Subsequently the testicle becomes soft and fluctuating in parts, and accompanied by a dull aching pain.

Enlargement of the scrotal and spermatic veins takes place on account of the increased supply of blood, commensurate with the rapidity of the morbid growth. The cord becomes thickened and indurated by the extension of the growth, and the lumbar and inguinal glands also affected. Should the disease be allowed to progress unmolested, the fibrous coverings of the testis ulcerate through, from the pressure and infiltration of the cancerous growth, and a fungating tumour is formed.

Accompanying the enlargement of the lumbar glands there is always lumbar pain and œdema of the leg and thigh, on account of the obstruction afforded to the circulation in the inferior vena cava. If the disease has progressed to this stage, the patient exhibits the worn expres-

FIG. 7.



Cancer of Undescended Testicle situated in the Left Groin.

sion incident to the cancerous cachexia, but which is absent in the earlier stages, and therefore cannot be relied upon as a means of diagnosis.

In severe cases the bodies of the vertebræ have been found affected with cancer, and similar deposits found in the lungs.

The origin of malignant sarcocele is frequently referred to some former injury, which may have been the exciting cause in a constitution previously predisposed; and that irritation or injury is an exciting cause is evident from the frequent occurrence of carcinoma in a partially descended testis, of which Fig. 7 is a representation, and where its position in the groin renders it liable to frequent injury and repeated inflammation. A retained testis, malignantly affected and forming a large abdominal tumour, has been removed by Mr. Spencer Wells as in the operation for ovariotomy; the tumour after removal weighing 9 lbs.

Hæmatocele may be mistaken for malignant sarcocele. A sudden enlargement following almost immediately upon some injury, unaccompanied by the acuteness of suffering attending acute orchitis and with the testicle situated posteriorly, of normal size and having the usual testicular sensation when manipulated, are the chief points of distinction. However, as a precautionary measure in all cases of excision of the testis, before division of the cord an incision should be made down to the sac of the tunica

vaginalis, and unnecessary mutilation thereby prevented by a step which is unattended by danger, and applicable to the treatment of hæmatocele, should such be found to be present.

Simple or syphilitic sarcocele has also to be diagnosed from the malignant variety; the former always presents a smoother surface, and may be combined with hydrocele, whereas such a combination with malignant sarcocele is rare in the extreme. If any doubt exists, it is well to try the effects of remedial agents, and should no alteration, but, on the other hand, a steady increase take place in the size, after the administration of iodine and mercury, the presence of malignant sarcocele may be affirmed.

Fibrocystic sarcocele presents many points of resemblance to malignant sarcocele, more especially in its early stages. Its growth, however, is less rapid, and its surface usually more even, and when punctured with a trocar, a blood-stained mucoid fluid comes away instead of the creamy fluid of cancer. Errors in diagnosis may occur, but as removal is the best treatment for both diseases, a correct discrimination between the two is not so material, and after removal diagnosis should be verified as an aid to prognosis.

As soon as malignant sarcocele is diagnosed, the sooner the diseased testis is excised the

better, in the hope of the operation being performed before the glands have become infected, and of the disease being as yet limited to the testicle. Recurrence is unfortunately frequent, but when there is a large discharging surface, removal is preferable, for should there be recurrence in internal organs, the symptoms, although equally distressing, are not so painful or objectionable.

*Excision of the Testis.*—The patient, having been put under the influence of some anæsthetic, should be placed on his back with the buttocks on the edge, and his legs hanging over the end of the operating table, and the arch of the pubes thrown well forwards.

The side of the scrotum and groin to be operated upon having been shaved, an incision extending from the external abdominal ring to the bottom of the scrotum is made down to the sac of the tunica vaginalis. The incision may be made to enclose an oval piece of the scrotum, should any suppurating or diseased spot be there present, but without such is the case it is unnecessary, as the apparently exuberant scrotal tissues soon shrink up on the removal of the enlarged and diseased testis. Care must be taken in making this incision that no rupture exists, or the incision might and has been carried into a

hernial sac. The incision should be carried to the very bottom of the sac of the tunica vaginalis to prevent any subsequent bagging of matter, and it is well, in all cases, to open the sac of the tunica vaginalis prior to ligaturing the cord, as I have known a testicle removed unnecessarily for want of this precaution.

The cord is then separated from the scrotal tissues and firmly tied by a ligature of strong whipcord or carbolised catgut; the idea that this proceeding entails more pain or even tetanus is not correct, but the enclosure of material between the ligature and artery is very liable to give rise to secondary hæmorrhage. The height this ligature should be applied varies according to the nature of the disease; when for cancer the higher the better, but ordinarily one inch above the testicle is sufficient.

The testicle is then dissected out from the surrounding tissues, care being taken not to injure the scrotal septum, and the cord divided below the ligature; or the cord may be divided first and the end used as a means for dragging upon the testicle. Another mode of operating is, after having dissected out the testicle and cord, to apply a clamp to the cord during its division, or to secure it by the fingers of an assistant, and then subsequently ligature the spermatic artery

and the artery of the vas deferens separately; or having applied the clamp, the testicle may be removed and the stump of the cord freely cauterized. Besides the two arteries previously mentioned, the cremasteric artery also requires to be ligatured. In the case of cancer any enlarged glands situated in the groin should be dissected out at the same time.

An idea has been started that on the division of the cord the pulse falls, but having given chloroform for this operation on several occasions I have never noticed such an effect.

The carbolic spray may be used, and I should recommend its adoption with the use of carbolic ligatures and sutures, whereby greater rapidity in the process of recovery is obtained. Silk sutures may be used, but not wire, as they occasion great discomfort to the patient by pressing upon neighbouring parts—namely, the penis and inside of the thigh. A drainage tube should always be placed in the lower angle of the wound, and if ligatures are used they should be brought out at the same place and act in a corresponding manner. The ligatures come away between the eighth and tenth day.

Secondary hæmorrhage, resulting from the giving way of a ligature, may be combated by the application of Signorini's tourniquet to the groin

this is generally successful. Should it not be so, the wound must be reopened and if necessary enlarged until the bleeding vessel is secured; an operation of difficulty from the retraction of the cord into the abdomen, and one of risk from the fear of subsequent peritonitis.

Some surgeons prefer to transfix the tissues of the cord by a ligature prior to tying the vessels separately; this ligature is left so that in the event of secondary hæmorrhage occurring the cord can be always dragged into view. This ligature is retained on the abdomen by means of strapping, and removed on the third or fourth day after operation.

The process of removing a diseased testicle from the groin is identical with what has been already described; the incision corresponding with that made for the operation of herniotomy in the same situation; greater difficulty from the shortness of the cord and the proximity of the peritoneum being points which must be taken into consideration prior to operation.

# CHAPTER XI.

## DERMOID CYSTS IN THE TESTIS.

Skin, hair, teeth, and bones have with great rarity been found in cysts connected with the testicle, but of which no specimen is extant in any of the London museums.

Descriptions of such pathological occurrences have been given in French periodicals, the two following being the most interesting. "Mémoires de l'Académie Royale de Médecine," p. 480, vol. iii. 1833 :—

"Ovide-Émile Caze, of the parish of Templeux-la-Force, in the district of Peronne, appeared at birth well-formed and of good health. About the latter end of a year his parents perceived that the right testicle was more voluminous than the left, and six months later the child was operated upon for hydrocele by Dr. Capon. The puncture was followed by the escape of a small quantity of serum, but it appeared after this evacuation that the testicle remained of greater size than normal, so that a surgeon of the place said that after two years a fresh operation would be one day necessary; nevertheless, the child did not suffer in any way.

"It was about ten months ago that the young Caze to-day (January 15th, 1834), aged seven years, began to

complain of swollen testicle, which became painful to touch. After the repeated application of emollient lotions to the tumour a small opening formed at the anterior part of the scrotum, which each day gave issue to a small quantity of thick white pus.

"It was then that Dr. Andre saw the young patient; the testicle was treble its usual size, of irregular form, adherent to its envelopes, painful on pressure, which caused a small quantity of pus to escape; the lymphatic glands in the groin were enlarged. At the end of a month there were seen issuing from the small wound in the scrotum a fleshy tubercle about the size of a cherry, in the centre of which was observed three ossific points which in polish and whiteness were analogous to that of the enamel of teeth.

"In removing this tubercle there was noticed in the opening of the skin some long hairs, and several were withdrawn.

"These several peculiarities were considered by Dr. Andre to indicate a tumour formed of the *débris* of a fœtus engrafted on the testicle, an opinion which was held by Drs. Legros, Coquin, Renard, &c., who deemed it necessary to assist in the work of elimination, which could not fail to produce the spontaneous separation of the tumour.

"Six weeks later a fresh portion had come through the limited wound in the skin of the scrotum, which was only adherent to the capsule of the tumour. This part of the tumour was eight lines in length, four lines in diameter; it was separated by a circular constriction from the fleshy tubercle primarily situated at that place. Although appearing fleshy it could be perceived by handling that it was not formed only of soft parts; it presented a second constriction in the neighbourhood of the skin, under which could be felt a circular pad of about six lines in diameter, which appeared formed by the adherence of the tumour to the testicle. The general health of the child was otherwise very good. The tumour becoming

more and more troublesome by its increase and by the roughness of its surface, a ligature was applied around it at its jutting out from the opening in the scrotum, at that point where it was rather more constricted, and more in the neighbourhood of its implantation on the testicle. The first effect of this constriction was the falling off of the fleshy tubercle which surmounted the tumour, and in the thick part of which was implanted three teeth. The rest sloughed and was carried away by the bistoury several days later.

"After the operation, Dr. Andre, desirous of knowing the composition of the chief tumour, states :—'I made an incision, thus dividing the greasy tissue into two parts; I discovered a little body very hard and bony, which I regarded as a small embryo; I noticed that the envelope of this osseous portion was not altogether adherent, and that it had the appearance of a cyst, which, perhaps, formerly contained the fluid obtained by the puncture made when six years old; perhaps that which I regard as belonging to a particular cyst is only a portion of the envelopes of the testis becoming adherent after the operation for the hydrocele.'

"To-day, the fifteenth after the separation of the tumour, the testicle has diminished in size; it is not painful now on pressure; the circular snare which indicated the attachment is less projecting, but the little opening is not entirely cicatrized. A little fleshy excrescence is still seen there traversed by some hairs, two of which, as long as two inches, are able to be extracted; I believe, however, that there remain few of these foreign bodies, and that ere long the cure will be complete.

"In laying this case before the Academy, Dr. Andre, of Peronne, submitted the tumour of which I had just given the description. We have dissected it with care, and have found the osseous body which he regarded as a small embryo is none other than a large molar, the crown of which is formed by an eburnated tissue, destitute of enamel, and of which the configuration is very irregular;

the portion which represents the root is formed of a spongy bony tissue, and excavated in its centre to such an extent that its extremity has much resemblance to the roots of the primary teeth. This osseous production was jutting out from the interior of a fibro-cellular cyst, of which we found the remains. In the portion of the tumour formed by the fleshy tubercle primarily springing out, we found three teeth, two of which were very small, irregular, and composed of a crown without root, whilst the third, the largest, was provided with both, and offers all the characters of a canine tooth. The crowns of the two largest are covered with enamel."

The following Case is reported by Dr. Velpeau at p. 97 of the *Gazette Médicale de Paris* in the year 1840 :—

"Gallochat, of Esternay, a young man of twenty-seven years, well-built, and who had never experienced any serious illness, applied towards the middle of January to Prof. Andral, who immediately transferred him into my ward in the Hôpital de la Charité.

"Examining the disease, I saw that he had on the right side of his purse a tumour of the size of a fist or thereabouts; this tumour, which appeared foreign to the substance of the testicle, and over which the skin was not analogous with that of the scrotum, did not appear to belong to the class of known tumours, so that several surgeons thought it to be due, one to cancerous tumours, others to fibrous tumours, and some to tubercular degeneration. I did not think that it was possible to adopt their opinions. Remarking, moreover, that its origin dated from the birth of the young man, that it had never caused him any pain, that no pathological change had taken place in it, that it was insensible to pressure, that it was possible to incise it, to prick it, to traverse it from side to side without causing the least suffering; taking

into account the aspect of the skin covering it, its elasticity, the hardness which it presented in its interior, the mesh of hair which came out of a sort of tubercle which existed in front at the bottom of another opening, and from glairy or grumous material which the disease had several times expelled, I came to the conclusion that it was a fœtal tumour, a product of conception. Wishing to obtain the precise notes on the first condition of so singular a production I wrote to M. Senoble, a doctor of Esternay, who quickly replied to me in these terms :—'At about the age of four months the mother of young Gallochat brought him with a swelling of his purse, which I recognised to be only a pneumatocele; some months after I remarked, in examining the patient a second time, a small inflamed tumour, which appeared to me to be only a slight phlegmon, and which yielded to simple emollient applications. I did not hear of it any more until at the end of three or four years I learnt that the child's tumour continued enlarging.' Though these details are very incomplete, and M. Senoble, who for some time had lost sight of young Gallochat, finds it impossible to furnish me with more precise information, they strengthened me, however, in my first opinion, which seemed so singular to those persons I consulted about it that I remained alone in my opinion. I conceived from that time the idea of extirpating the tumour, which it was advisable to do without removing the testicle, to carry out in some sort a Cæsarian section on the man. The details of the operation belonging altogether to surgery will not occupy me at the present time; it is sufficient to say that it has terminated as I desired.

"The examination of the tumour proved it to consist in the greater part of nearly all the anatomical elements of a mammiferous body. Thus, the external covering is evidently of a cutaneous nature; its principal substance is a medley of lamellæ and fibres, which gives the idea of adipose, fibrous, cellular, and muscular tissues. In its interior we found two small cysts filled with a material

analogous to albumen or vitreous humour; another cyst as large as a partridge's egg contained a yellowish-green and half liquid material like meconium; in a fourth bag there exists a gummy mass, of a dirty-yellow colour, hardened and surrounded with hairs; this material, analysed and examined under the microscope by M. d'Arcet, shows it to have all the characters of sebaceous material and of epidermic scales. Examined by M. Mendl, the hairs of this cyst appeared to have no capsules at their extremities. From one of these cysts, that which was full of the greenish material, came out the mesh of hair which was seen from outside, so that there existed at that spot an opening bearing some resemblance to the anus. Moreover, in the middle of all these elements we found numerous portions of a perfectly organised skeleton, undoubtedly composed of veritable bones, and not accidental productions. These bones, which were entirely enveloped by a sort of periosteum, the several pieces being movable one upon another, possessed real articulations, and can be divided into three catagories.

"The first group is composed essentially of three pieces, in which I fancied I recognised the clavicle, scapula, and part of the humerus.

"The second group, much more voluminous than the first, seemed to belong to the pelvis or to the base of the skull; it is either the body of the sphenoid or the sacrum which would constitute the central part.

"Lastly, the third series appeared to consist of portions of vertebræ or fragments of undeterminable bone."

From the above the great similarity of these growths to the dermoid cysts growing from the uterine appendages will be at once seen, and like them they are similar in their mode of formation from cysts, and also in their mode of termination, by setting up inflammation and

suppurative action. Their contents are thus discharged by apertures communicating with natural passages or through fistulous openings on the exterior of the body. As with all dermoid cysts they have a congenital history, and their origin of growth must be traced back to the development of the generative organs from the epiblast or outer layer of the blastodermic membrane; and it was on account of their being connected with embryonic structures that I included them in a Paper contributed to the St. Thomas's Hospital Reports of 1874, looking upon them as being connected with some unobliterated portion of the Mullerian Duct.

Their mode of growth is attributable to the peculiar reproductive power inherent in all tissues of the body, in these cases to the epithelial lining of the cyst-wall, which is as operative in the production of these vagaries as it is in the production of those morbid growths like epithelioma, of which no explanation can frequently be given.

## CHAPTER XII.

### NERVOUS DISEASES OF THE TESTIS.

Irritable Testis.—This disease consists in an exaggeration of the natural sensibility of one or both testes; when both are affected, which is generally the case, the left is usually the more acutely sensitive, and when only one is affected it is usually that on the left side.

This increased sensibility is of such an acute description that no pressure, not even the friction of the patient's dress can be tolerated, and in some cases the pain becomes intolerable unless the scrotum is supported or the patient remain in a recumbent posture.

The pain is constant and frequently referred to some particular spot of the testicle, thence extending up the cord to the loin; both organs are generally involved, and the scrotum instead of being contracted as in neuralgia testis is relaxed and pendulous.

If manipulation is practicable, the pain being

so greatly increased thereby, the testicle is found usually healthy; but if the disease is of long standing, it is associated with a certain amount of varicosity of the spermatic veins as the result of the pendulous condition of the scrotum.

The disease is usually met with in persons of a nervous or hypochondriacal temperament or in youths arriving at the age of puberty, and whose testes are in a state of congestion. Excessive indulgence in sexual intercourse as well as excessive abstemiousness are the predisposing causes of the complaint, and Mr. Curling relates a case of a person of chaste habits thus affected in whom the morbid sensibility disappeared on marriage. The complaint is thus intimately connected with the functions of the generative organs, and the cause is to be found either in their disuse or abuse. Spermatorrhœa is also an occasional cause.

Castration has been requested by patients on account of the severity of the suffering, but it is never justifiable, and, although the progress of cure is tedious, the disease will eventually yield to treatment. The testicle, moreover, after removal has been found quite healthy. The treatment of irritable testis must be directed to the origin of the complaint, and all faulty habits prohibited.

Constant occupation both of mind and body

should be resorted to, as brooding over the complaint increases the patient's suffering, and on that account change of air and scene are always advantageous. Cold douching night and morning is beneficial, both in relieving the pain and bracing up the relaxed scrotum, which should be supported by a suspensory bandage in the intervals. Combined with this treatment, the internal administration of quinine or iron should be employed. I have, however, found that phosphorus, given in the form of the vitalized phosphites as sold by Messrs. Maw, Son & Thompson, to be of far greater benefit; and, in fact, in all debilities of the sexual organs, accompanied by spermatic or other discharges, whether produced by excessive indulgence or not, phosphorus in this form is highly beneficial.

*Neuralgia Testis.*—Neuralgia testis differs from the last described nerve affection or irritable testis in the attacks of pain being periodical and limited to one side; and in the pain not being constant or subject to increase on pressure, friction, or when the scrotum is unsupported.

Nerve irritation is found not unusually associated with varicocele, thickening of the epididymis, passing of renal calculi or dependent upon impaired digestion, associated with a gouty or bilious temperament.

True neuralgia testis consists in some irritation of the spermatic nerves just as in tic doloreux, and dependent either upon disease at the spinal cord or at some point of the spermatic nerve. This affection may follow an attack of orchitis, and occur at any age after puberty.

The symptoms are those of pain, of a shooting or darting character, occurring in paroxysms, of greater or lesser intensity; there is usually absence of pain on handling, unless a certain amount of morbid sensibility be also present. The pain is usually limited to one side, extending to the groin and to the inner side of the thigh, and in all directions corresponding with the distribution of the pudic nerve. Showing the hyperæsthesia of the pudic nerve, the scrotum is rigidly contracted, and the right testicle being situated the higher of the two is thereby brought into close proximity with the external abdominal ring. Castration is frequently desired with the idea that the severe pain will disappear as soon as the testicle is removed. Such is not, however, always the case, for the disease has after castration returned with equal severity. In these cases the seat of the nerve irritation being above the point of section of the spermatic nerves, the object to be afforded by castration is frustrated, and the testis and nerves supplying it have after

removal been found to be perfectly healthy. When the neuralgia is due to some morbid state of the testicle or parts adjacent, doubtless castration has cured the affection, but the concomitant varicocele, orchitis, &c., which are severally the causes of the neuralgia in these cases, are amenable to treatment less severe than that of castration, which is only justifiable when the neuralgia is caused by some disease of the testis which will not yield to milder measures.

The difficulty in the treatment of this affection is at once apparent from the number of remedial agents which have been suggested, one succeeding in the hands of some, another in the hands of others. Great things may be done by hopeful advice, for the disease is usually found amongst hypochondriacs; the great depression found associated with all diseases of the generative organs, whether in the male or female, consequent upon the idea of incompetency, tending greatly to aggravate the disease. Having, if possible, found the cause of the neuralgia the treatment should be directed thereto, and whether it be varicocele, renal disease, orchitis, epididymitis, or due to impaired digestion such treatment will be identical with that of those diseases. It is in the true neuralgia testis that the difficulties in the mode of treatment are met with.

The pain being paroxysmal, antiperiodics of all kinds are beneficial, more especially quinine, iron, liq. arsenicalis, and strychnia. Phosphorus, in the form of the vitalized phosphites, as recommended in the treatment of irritable testis, is also very beneficial. Mr. Curling recommends the use of bromide of potassium in those cases of neuralgia which arise from forced chastity.

Much good may be done by the application of local sedatives, such as poppy fomentation, or belladonna ointment. Professor Humphrey suggests the use of the subcutaneous injection of a solution of morphia, judging from its beneficial effects in relieving neuralgia in other parts. I have also seen relief afforded by blistering along the course of the pudic nerve, as in the treatment of sciatica, the blister being subsequently dressed with some local sedative, such as an ointment of the acetate of morphia, of three to five grains to the ounce.

J. S., aged thirty-nine, was first seen on June 30th. He complained of severe pain in the right testicle, more especially when handled; quite free from pain on the left side. The report states that the pain is of a shooting character, comes on suddenly at times and extends through the cord up to the groin, and also to just below the crest of the ilium. He had gonorrhœa six month

back, which lasted six weeks and was not followed by any swelling of testicle; no gleet remains; the epididymis on both sides is thickened. He suffers also from slight tendency to rupture on both sides. Ordered to rub mercurial ointment into both groins every night.

July 9th.—Thickening remains only in left epididymis; pain but slightly relieved. Ordered one ounce of quinine and iron mixture three times a day, and to continue using the ointment on the left side until the thickening disappears.

September 15th.—No thickening remains, and pain almost gone, but slight towards the end of the day. Both testes much drawn up, so much so that he believes the right testicle will be drawn into the abdomen, and refuses to take a cold bath in consequence. Undoubtedly hypochondriacal, having broken his matrimonial engagement in the belief of incompetence. No discharge from urethra or any nocturnal emissions.

October 24th.—Has pain now but seldom; no particular spot painful; pain affects him suddenly, shooting up into the groin. Suspending the scrotum has no effect in relieving pain.

November 26th.—Pain has now disappeared, but he states that "the cup and ball position of the right testicle is distressing to him," and "is certain that the testicles being drawn up taut

into the neck of the canal—in fact, almost lost—is not the normal condition of matters." Still taking tonic remedies. This case is interesting when compared with cases of varicocele, the pendulous scrotum being due to a paralysis of the muscular dartos, the taut condition to a hyperæsthesia of the nerves supplying the same muscle. The reason why more anxiety was expressed about the right testicle was on account of its being situated higher, and had consequently the appearance of being the first to be pushed out of the scrotum.

# CHAPTER XIII.

## VARICOCELE.

The term varicocele has from use become to be regarded as meaning a dilatation of the spermatic veins; although, more correctly speaking, circocele is the dilatation of spermatic veins, and varicocele the dilatation of scrotal veins. In conformity with custom, varicocele will be here described as a dilatation of the spermatic veins.

Varicosity of the scrotal veins is not often met with. Emptying themselves into the iliac veins, the causes of obstruction to their outflow are few in number. The aged are those usually affected, whereas it is the young adult who suffers mostly from varicocele. I have met with one well-marked case of enlargement of the scrotal veins without any concomitant enlargement of the spermatic veins in a case of aneurismal varix of the left common iliac vein, which was reported in the *Lancet*, March 6th, 1875. The impediment to the return of the venous blood was limited to

Fig. 8.

Varicosity of Spermatic Veins.

the left side, and there being no varicocele was accounted for by the impediment being below the entry of the left renal vein into the inferior vena cava, whereas the left scrotal veins being below the obstruction accounted for their varicosity.

The spermatic veins in varicocele become thickened, elongated, and more tortuous; and assume somewhat of a pyramidal shape, having its apex upwards. This is explained by the greater complexity of the veins in the region of the testis, and their gradually emptying themselves into less numerous channels in their upward course. The veins are arranged in three divisions; those coming from the epididymis, and those coming from the upper and lower ends of the body of the testicle. The veins in the interior of the gland, being also in a varicose condition, are the principal cause of the atrophy of the testis, which results from their pressure upon the secreting gland structure. The spermatic veins are provided with valves, and may occasionally contain phlebolites.

The left side is the one more usually involved. The left testicle hanging the lower, and the veins on that side being longer, and consequently more congested, is generally stated to be the chief reason of the greater frequency of this

side becoming affected. Should such be the case when the right testicle hangs the lower, varicocele ought to be found on this side also; but as the right testicle is but seldom the lower, the comparison of the frequency of varicocele on the more pendulous side is difficult. But when both sides are diseased, that which hangs the lower is always the more seriously affected.

The difference in length, however, between the two sides is so trifling, that probably the chief reason lies in the impediment caused by an overloaded condition of the sigmoid flexure of the colon, and consequent obstruction to the return of blood from the spermatic vein; and it is for the same reason that varicose veins in the leg are more frequent on the left side.

Further evidence in support of this being one of the chief causes is the fact that some patients suffer from varicocele only when affected with constipation, and that the use of aperients cures the disease; also that a varicose condition of the veins of the ovary is always confined to the left side.

The mode of entry of the left spermatic vein into the left renal vein has been held to be one of the chief elements in producing varicocele on this side; the blood from the kidney meets that coming from the testicle at right angles,

whereas the right spermatic vein joining the inferior vena cava at an acute angle, the two streams of venous blood run onwards in the same direction. Such has probably little to do with the origin of this disease, as in cases of renal congestion due to obstructive heart and lung disease varicocele is not commonly met with.

The most frequent cause of varicocele is due to the want of support from a pendulous condition of the scrotum, this pendulous condition being the result of loss of power in the pudic nerve, thereby producing paralysis of the muscular dartos, which is instrumental in bracing up the scrotum and supporting the testes. Masturbation is frequently cited as an origin of varicocele, but it is not so, any more than excess of sexual intercourse, and then only secondarily in producing, first, loss of nerve power and pendulous scrotum, then varicocele, varicocele being occasioned by the pendulous scrotum, and not by masturbation or sexual excess. A pendulous scrotum is not, however, always indicative of the above, as any disease tending to produce loss of power in the pudic nerve is sufficient to produce this complaint; and I would impress the importance of treating a pendulous scrotum by electricity, cold douch-

ing, and other mild measures, before the more serious complaint of varicocele becomes developed. The frequency of varicocele from the pendulous condition of the scrotum, due to the relaxation consequent upon a residence in hot climates, is a proof of the truth of this assertion.

Under the heading of causes due to obstruction, should be included tumours of any description affording impediment to the return of the venous blood, as well as the pressure arising from the too strong spring of an inguinal truss.

Varicocele may probably also be caused by a pathological disease of the spermatic veins—namely, venous aneurismal dilatations, the tendency to which is often hereditary.

Violent exercise is undoubtedly a frequent cause of the disease, more especially any tending to injury of the perinæum or parts adjacent, such as in horse-riding and bicycling; and a great number of the cases I have met with have been among grooms, ostlers, and men in horse regiments; some injury to the vein, which may have already a diseased condition of one or other of its coats, or injury to some filaments of the pudic nerve in its passage over the spine of the ischium, being the exciting cause.

Varicocele is most frequently met with at

puberty, between the ages of fifteen and five-and-twenty, gradually decreasing in frequency before and after these periods. Probably the increased activity of the blood supply, incident to the higher development of the testes at puberty, has something to do with the origin of the complaint, increase of function tending to hypertrophy of blood vessels.

There is no connection between varicocele and varix of the veins of the lower extremity; the conjunction of the two being the exception, and not the rule.

Debility of the generative organs is often found associated with varicocele, the former being part and parcel of the same disease; and in such cases mental depression is always met with, as with any disease affecting the generative organs.

Varicocele, when increasing in size, tends gradually to produce an atrophic, or wasted condition of the corresponding testicle. However, when the varicocele is only slight in degree and not increasing in size, no such fear need be entertained.

The symptoms in varicocele are those of pain, usually of a dull, aching character, extending from the scrotum round to the loin, intensified when walking or when in an erect posture. Pain, however, varies in character from neuralgic and

intermittent to one continuous, excessive, and intolerant—so much so that castration has been demanded and justifiably acceded to. The scrotum will in appearance be lax and pendulous, and on manipulation feel like "a bag containing worms." Less pain, consequent upon a less relaxed condition of the scrotum, is always noticeable during cold weather; and less pain is also experienced when the scrotum is supported. Old people usually suffer less than young; but when the disease occurs in old people it is more frequently met with on the right side, and when so situated is usually less painful.

The swelling is pyriform in shape, with the broader portion below, as the greater number of the veins are situated in close proximity to the testicle, and this enlargement is subject to increase when the patient stands, and on his coughing or straining. M. Landouzy states, with great truth, that the pain is lessened during and immediately after coition, and increased after the subsequent relaxation; this being due to the taut condition of the scrotum during erection, consequent upon the excitement of the pudic nerves supplying the muscular dartos.

Varicocele, though usually chronic, occasionally forms suddenly after some injury, and many

cases probably owe their origin to this cause, looking at the frequency of varicocele amongst those accustomed to much horse exercise. An injury to a healthy, or perhaps diseased blood-vessel, will occasion the rupture of one or both of its inner coats, and an aneurismal swelling is the result; whereas when the outer coat is also involved hæmatocele is the consequence. Mild cases produce no symptoms, and consequently many curable cases, through not being seen early enough, become incurable except by active interference.

The diagnosis of varicocele is usually easy, hydrocele of the vaginal process of peritoneum and scrotal hernia being the two diseases most likely to mislead. Varicocele, especially when the disease extends high up the cord, may be mistaken for a hernia, both having an impulse on coughing. If the patient assume the recumbent posture, the swelling will disappear slowly and incompletely; then, placing the finger upon the external abdominal ring, and desiring the patient to stand up, the swelling will return in cases of varicocele and hydrocele, but not in the case of hernia. The pressure exerted should not be sufficient to prevent the egress of fluid, and when all pressure is taken off the swelling will be found to recommence from above in hernia,

from below in varicocele and hydrocele. Transparency in the case of hydrocele of the vaginal process of peritoneum, and its absence in varicocele, will decide between these two diseases.

Not all cases of varicocele require active interference; the regulation of the action of the bowels by purgatives, the bracing up of the scrotum by cold douching, and its support by a suspensory bandage, being in many cases all that is required. The lower portion of the scrotum passed through a soft metallic ring, protected by leather or india-rubber, which is bent so as to shut off the lower portion of the scrotum enclosed within it, so as to keep the testicle supported above, has been recommended by Mr. Wormald, but it has not met with sufficient success to merit its adoption. The application of a moc-main truss, if not too tightly applied, has been found beneficial by taking off the weight of the column of blood; but patients are seldom found to submit to the inconvenience of wearing a truss when operation will radically cure them.

What is known as the radical treatment should be adopted for those cases more severe in character, which tend ultimately to produce atrophy of the testis or which occasion severe pain; also in the milder form of the disease should it inca-

pacitate the patient from passing the medical examination required for entry into the public service. By radical treatment is meant the obliteration of the spermatic vein by one or other of the numerous methods to be suggested. As they are numerous, one would naturally ask when one should be preferred to another; but I hold that operation to be the best which is successful with the least amount of suffering, this remark being as applicable to the cure of varicocele as to other diseases. Whatever mode of operation be preferred, it should be performed subcutaneously, and the operation to which I give the preference is that of acupressure. The following Case exemplifies the mode of operation and its progress:—

J. B., æt. seventeen, a greengrocer, was kicked about a year ago in the scrotum; the left testicle began at once to decrease in size, whereas the right was in consequence swollen. On examination the right testicle was found to hang the lower, which he believes has always been the case, and the veins above were considerably varicosed. The left testicle was atrophied. On September 10th, the veins having been separated from the spermatic artery, which lies in close contact with the vas deferens, and known by its cord-like feel, I passed a hare-lip pin through the scrotum

behind the veins, and brought it out again through the scrotum as near as possible to the point of entry, the veins being thereby compressed between the pin and the scrotum, as in the first form of acupressure. The scrotum was supported by a band of strapping passed across the thighs and an ice-bag applied.

September 14th.—Going on well, suffers but slight pain from the effects of the operation. Pin removed after being in about eighty-four hours.

September 20th.—Having been supplied with a suspensory bandage the patient left the hospital cured. I have since seen the boy, and the operation has been highly successful. M. Onimus recommends the passage of a small steel needle, communicating with the positive pole of a battery into one of the most enlarged veins, the negative pole being applied on the skin of the scrotum. The passage of the current gives no pain, and after about three electrizations the blood becomes coajulated. Mr. J. Wood is in the habit of including the spermatic veins within a wire noose, which is gradually tightened until the wire separates of its own accord.

M. Ricord's operation is similar in principle. One loop of wire is passed in front and another behind the veins, one emerging from the scrotum where the other enters. The ends of wire on

each side being then passed through the contiguous loop and drawn in opposite directions, the veins are compressed, and being daily tightened, separate in from ten to twenty days, and the veins thereby divided. A favourite, and the most frequently adopted, method of treatment is that known as Mr. Henry Lee's, of which the following is an example:—W. R., æt. twenty, a typefounder, was admitted into hospital on June 21st with varicocele of the left side. He first noticed a small lump the size of a bean four years previously on the left side of the scrotum above the testicle. It had never caused him pain, but the swelling slowly increased in size up to the present. The varicocele situated on the left side is not tender to the touch or at any time painful, in size slightly larger than a horse chestnut, increased on the patient's standing or coughing; scrotum pendulous. On June 26th, the veins having been separated from the spermatic artery and vas deferens, I passed two hare-lip pins behind the veins at about an inch apart, subsequently arresting the passage of blood in the veins by silk sutures applied in a figure-of-eight form around the ends of the pins, the lower being first tightened. Midway between the pins the veins were subcutaneously divided by a tenotomy knife (a prior puncture

may be first made with a tenotomy knife and fine-pointed scissors similar to those used for strabismus employed for dividing the veins) and the punctures closed with collodion. An ice-bag was applied and the scrotum supported by a band of strapping passed across the thighs. Chloroform was not administered, for the reason that with the patient standing the veins are brought into greater prominence and give greater facility to the operator. After the operation the patient complained of pain extending up to the left loin lasting six or seven hours, due to the inclusion of nerve fibres in the compression by the pins, and similar to the pain met with in nervous disorders of the testis.

June 28th.—Testicle swollen and tender, no effusion into the tunica vaginalis. No ecchymosis between the pins. Temperature never above normal.

July 2nd.—Pins removed, slight ulceration at their points of exit from the scrotum. Swelling of testicle subsiding.

July 10th.—Left his bed, and on the 12th was presented cured.

Sir B. Brodie was in the habit of dividing the veins subcutaneously, but instead of using pins, as in the previous method, applied pressure.

Atrophy of the testicle has been known to fol-

low the obliteration of the spermatic veins for the cure of varicocele; in some instances due to the spermatic artery having been obliterated at the same time, but in the majority of cases the testicle had previously atrophied from the long-continued pressure upon the seminal structure, due to the varicosity of the veins in the interior of the gland, the atrophic condition becoming only apparent after the shrinking of the dilated veins. Excision of a portion of the dilated vein under the carbolic spray has been performed by Mr. Howse with great success, the operation being similar to that adopted by Mr. Marshall for the cure of varicose veins of the leg. To my mind the magnitude and attendant risk of this operation hardly justifies so severe a measure, an equally satisfactory result being obtained by a less formidable operation. The removal of the lower portion of the pendulous scrotum with the object of supporting the testicle was a plan adopted by Sir Astley Cooper. The invagination of the scrotum into the inguinal canal, as in Wutzer's operation for the radical cure of hernia, has been also tried but without effect. The operation is wrong in principle, for it is in no way directed to the cure of the disease.

## CHAPTER XIV.

### ADIPOSE TUMOURS OF THE CORD.

Fatty tumours of the cord are occasionally met with in old persons, and are very liable to be mistaken for cases of omental hernia. Isolated masses of fat are also liable to be mistaken for varicocele: the permanence of the swelling in cases of lipoma and its subsidence in varicocele on the patient's lying down is the distinguishing symptom. These fatty tumours are of the continuous or diffused variety, and are situated upon or diffused among the structures comprising the spermatic cord, or even upon the testicle itself. Morgagni mentions a case where fat was deposited in the testicle, and from which "he inferred that tumours of the testis occasionally originate from an unnatural generation of fat, and its subsequent increase." In St. Thomas's Hospital Museum, Prep. 2, E. E., shows the epididymis occupied by a mass of deep-yellow coloured fat, four times larger than the atrophied

testis, and extending three inches along the cord, and which ultimately caused obliteration of the communication between the vas deferens and testicle.

Fatty tumours of the cord occasioning no inconvenience do not necessitate any interference unless they tend to increase so much in size as to produce atrophy of the testis, as in the case previously cited, or where symptoms of strangulation occur sufficient to fear the combination of hernia. An incision should then be made carefully down upon the tumour, and the growth removed.

Prep. 4, E. E., St. Thomas's Hospital Museum, shows obliteration of the epididymis and absorption of the testis, consequent upon pressure resorted to for the cure of a lipoma of the cord.

THE END.

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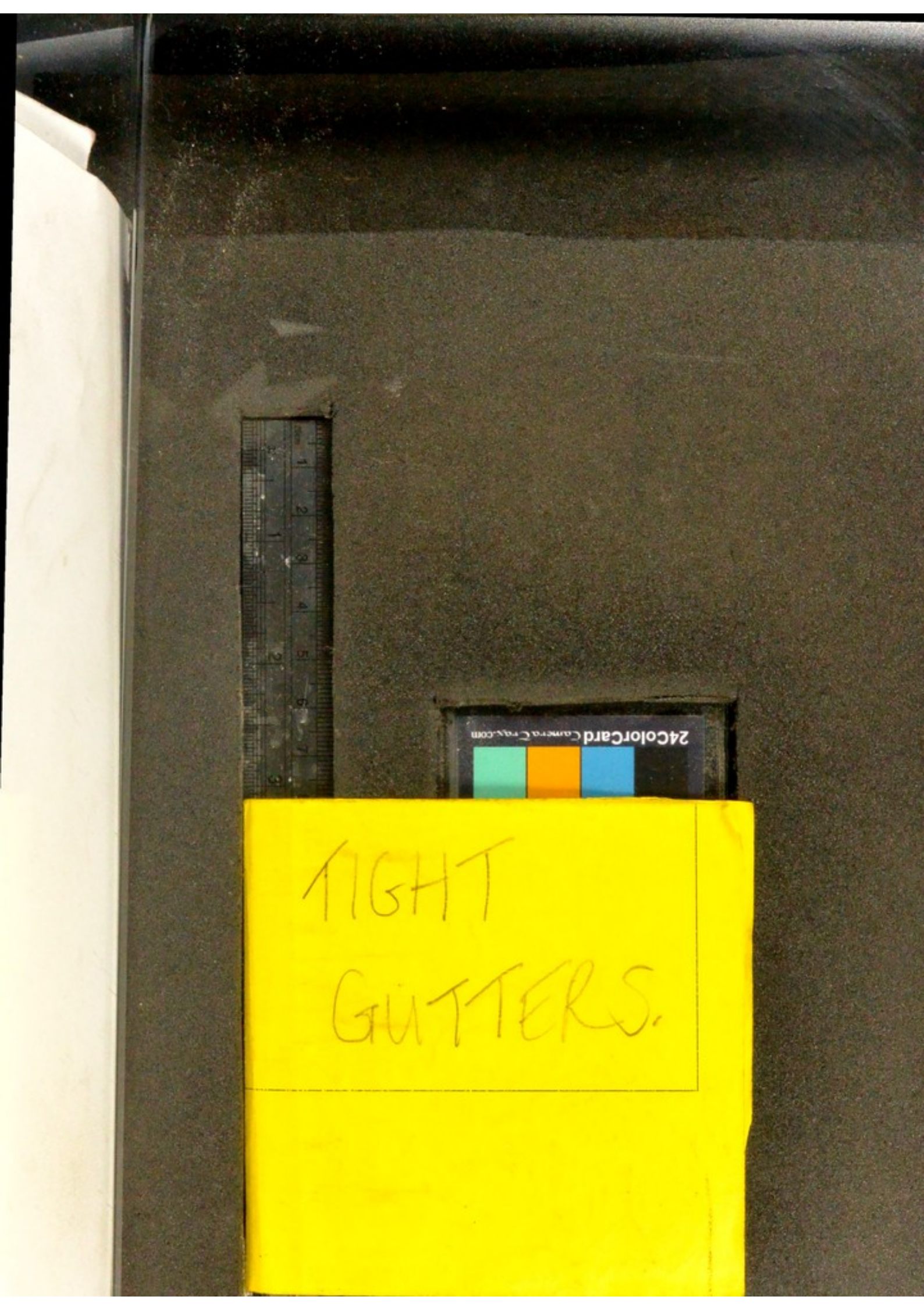
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